

# The Iron Age

A Review of the Hardware and Metal Trades.

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## Clemens' New Mechanical Movement for Transmitting Rotary Motion.

The annexed engraving illustrates a new mechanical movement for transmitting rotary motion in substitution of bevel gears, the invention of Mr. Melville Clemens, now of Philadelphia, Pa. This invention is wholly original in its principles of construction and operation, being in fact the discovery and practical application of a very useful new system of mechanical transmission of power in angular planes of rotation. In all the jointed mechanisms for transmitting rotary motion between angular shafts—which are chiefly Dr. Hook's "universal joint"—and its various modifications—three radical defects exist, namely, inflexible jointing, a limited deflection of the line of shafting, and the transmitting by the joints of dissimilar and variable angular velocities from the driving to the driven shafts. These defective features, though partly counter-remedied by uniting two joints in one "double universal joint," have made them impracticable only for limited uses, and almost wholly so on heavy shafting.

In Mr. Clemens' apparatus absolutely the same angular velocity of the driving shaft is transmitted to the driven shaft, with positive exactness and avoidance of back-lash, and the joint makes a self-adjusting, flexible coupler, enabling the connection of the shafts at all desired angles of deflection, from a straight line up to and even beyond a right angle. Compared with bevel gears, especially for heavy work, the superiority of Mr. Clemens' shaft coupler consists in its being noiseless; its having no back-lash; its greater strength, durability and safety, and its complete range of shaft divergence.

The construction and operation of the shaft coupler will be understood by reference to the engraving, which shows sections of two shafts, *a* and *b*, connected by it at right angles, with their axis lines, *c d* and *e f*, intersecting at the point *g*. On the shafts *a* and *b* are fixed, concentrically with their axes, the like cylindrical heads *h* and *i*, each of which are dotted transversely, forming like jaws, on which are attached, by bolts *l*, journal caps *k k*. Journal bearings are formed through the jaws at right angles to and concentric with the axis lines of their respective shafts, in which journals are fitted like journal pins *n n*. The four equal coupler arms *o p* and *q r* are carried in pairs in the jaws by their hinge-jointed hubs on the pivot pins *n n*. The right-angle lines *s s* and *t t* locate, equidistant from the point *g*, the respective planes of rotation of the pins *n n*. The outer ends of the arms are coupled together by two like ball-and-socket joints, each joint being formed by a ball turned up on one arm and fitting a babbeted take-up socket-box formed on its connecting arm.

The four equal lines, *u v*, *w w* and *x x*, *y y*, in the same plane as the shaft axis lines *c d* and *e f* are, respectively, the axial lines of the four arms *o p* and *q r*. The line *v w* represents the circle of rotation in which the center points *v* and *w* of the balls revolve, the lines *y y* being their axis of rotation. The weights *z z* on the arm hubs preserve the balance and uniform momentum of the rotating and vibrating arms. The pivot pins *n n* are cored out for oil reservoirs, from which oil is supplied through holes plugged with leather both to the journal bearings and to the ball joints, making the apparatus self-lubricating. Motive power being applied to rotate either shaft, the inner ends of the arms will revolve with their respective shafts in the planes *s s* and *t t*, while the outer ends of the arms will revolve in their diagonal circle of rotation *v w*, which compound rotary movements cause the arms to vibrate, both on their pivot pins *n n* and at their ball joints, with equal pivot movements, the arcs of vibration at each pivot being, in each revolution of the shafts, equal to the angle of deflection of the coupled shafts. The angular velocities of the two shafts are evidently the same at all points of a revolution of them, when we consider the arms of each opposite pair as equal levers in all their positions during a revolution. The de-

vice is, therefore, a true and perfect mechanical movement.

The geometrical analysis of this new movement, in tracing its transmission of motive energy from the plane of rotation of one shaft to that of the other shaft, in various positions of their revolution, is a most complex and beautiful study, which we have not space to illustrate, but which will greatly interest the technical student to investigate.

Mr. Clemens has patented his invention in the United States, Nov. 2d, 1869, and April 23d, 1872, and has also taken out foreign patents. His invention is now brought into successful practical form, and can be recommended to engineers and mill owners as a most desirable substitute for heavy bevel gears.

One of his shaft couplers of 100 horse-power

unmixed with those of the wood which had formed the funeral pyre. The process of working this textile has been rediscovered by the Marquis de Batres, as well as the means of making with it incombustible paper and cardboard at a low price.

## The Statue of Liberty in New York Harbor.

The *Times* gives the following account of the French idea of erecting a statue of the Goddess of Liberty in New York Harbor, and the means which have been taken to carry out the design: The plan, originated in France, to erect on Bedloe's Island, in the Bay of New York, a colossal statue of the Goddess of Liberty, needs to be urged to a certain degree by the people of

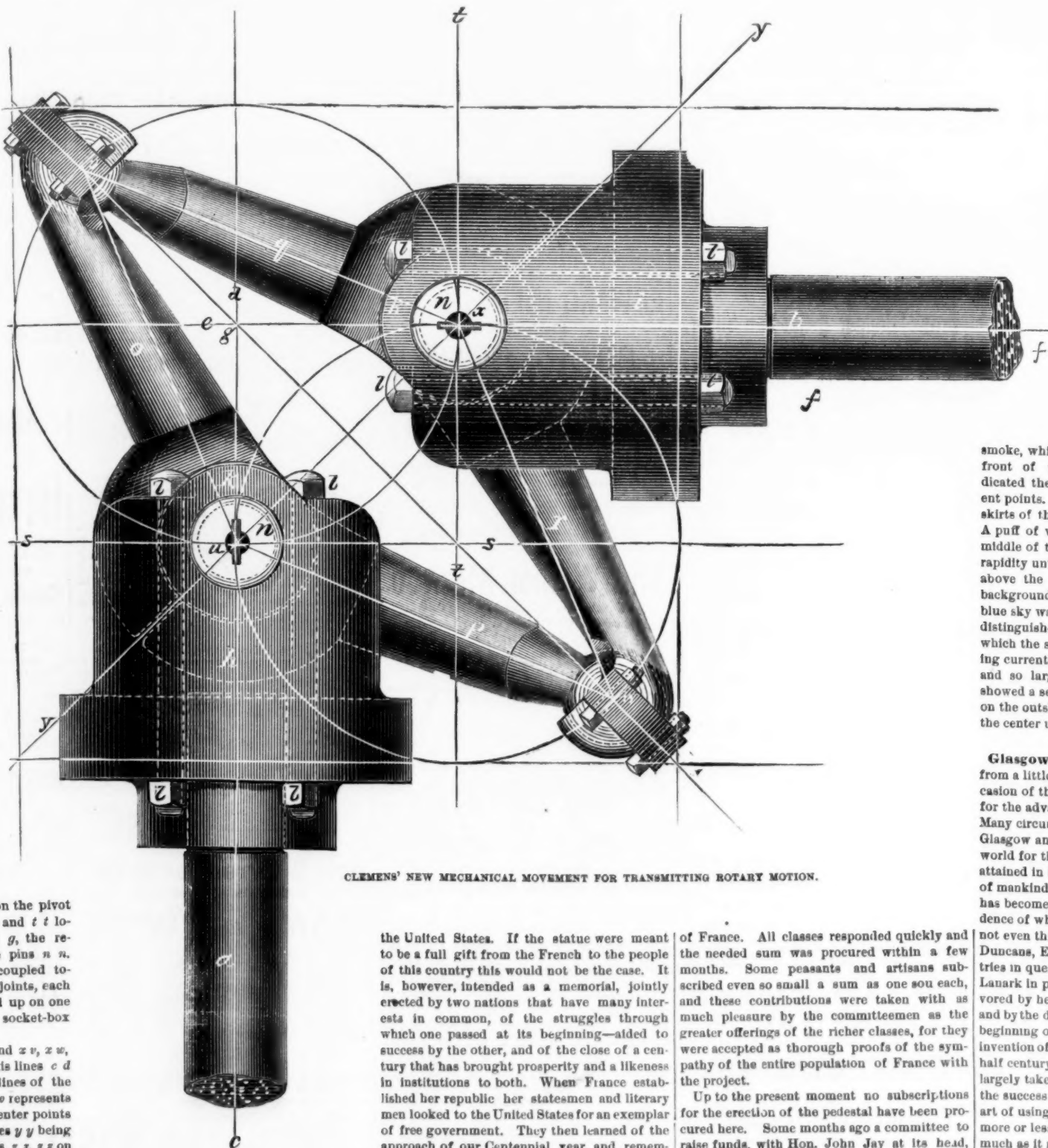
political difficulties and physical disasters that impoverished the people of France. On the 6th of November, 1875, the first real movement to carry the project into effect was made at a banquet at the Hotel du Louvre, in Paris. Over 300 of the most distinguished men of France were present, among them MM. De Lafayette, Laboulaye, Bartholdi, and Alexander Dumas, Minister Washburne, Gen. Sickles and Col. John W. Forney were also in attendance. An association named the Union Franco-Americaine was formed, and preparations were made for the procuring of subscriptions. It was then decided that France should defray the cost of the statue, while America should supply the granite pedestal. The cost of the statue was estimated at 300,000 francs (\$60,000), and subscriptions were requested from all the people

people have got fairly to work. They feel that the people of France have done well, and deserve the recognition which the immediate expression of interest here would give them. M. Bartholdi has completed the model of the statue, and one of the hands is now on exhibition at Philadelphia. The casting of the other part of the figure will be proceeded with after the return of the artist to France, about a month hence. The statue is expected to be completed in time for the Paris Exhibition of 1878, and will then be erected temporarily on the Trocadero, a hill overlooking the Champs de Mars.

**Currents of Air in Crowds.**—A correspondent of the *Journal of the Franklin Institute* contributes the following interesting item concerning the direction of currents of air in a large crowd of persons out of doors: At the gathering of people on the occasion of the opening of the Centennial Exhibition on the 10th of May, 1876, a striking example and illustration was observed of the fact that a crowd lives only by aid of the ascending current from the bodies of the persons composing it. The observer was sitting on the platform in front of Memorial Hall, and all the space between this platform and the Main Building, a space of probably 150 feet in width by 500 feet in length (of dense crowd), was occupied by about 40,000 persons, standing as closely as comfort would allow. The air was quite warm, about 75° Fahr., and a light breeze was blowing from the West. There were many smokers in the crowd, and it was noticeable that the course of tobacco

smoke, which showed white against the brown front of the Main Exhibition Building, indicated the course of the current at different points. A breath of smoke on the outskirts of the crowd was dispersed irregularly. A puff of white smoke anywhere toward the middle of the crowd rose with great apparent rapidity until it was lost to sight by ascending above the line of roof of the building; the background of white clouds, with which the blue sky was then broken, not allowing it to be distinguished higher up. The swiftness with which the smoke rose showed that the ascending current in the center of so thickly thronged and so large a space, was rapid. In fact it showed a set of currents like those at a fire—on the outskirts tending toward the center, in the center upward.

**Glasgow and the Clyde.**—The following is from a little handbook prepared upon the occasion of the meeting of the British Association for the advancement of Science at Glasgow: Many circumstances have contributed to make Glasgow and the Clyde famous all over the world for the position which they have now attained in the application of iron to the wants of mankind. Skill in mechanical construction has become almost an inherited faculty, as evidence of which we can refer to at least two, if not even three generations of Napiers, Denny's, Duncans, Elders, Neilsons, &c., in the industries in question. Then, again, the county of Lanark in particular has been abundantly favored by her deposits of coal and ironstone; and by the discoveries of David Mushet, near the beginning of the present century, and the great invention of James Beaumont Neilson, nearly half century ago, those mineral deposits became largely taken advantage of. Lastly, much of the success of the district in the science and art of using iron to advantage must be traced more or less directly to the Clyde itself, inasmuch as it rapidly became in the hands of the Clyde Navigation Trustees, a great public water highway, a magnificent channel from whose banks iron-clads of the largest size and merchant ships of the largest class could safely be launched. No river has attracted more attention, been more written about, or has had a larger amount of engineering talent spent upon it, and certainly no river in the world has derived more beneficial results from engineering science. Provided with such an invaluable highway to the open sea, and thence to all parts of the world, the shipbuilders and marine engineers were not slow to locate their great industrial establishment upon its banks, and eventually the Clyde has become, and is universally acknowledged to be, the great headquarters of the shipbuilding industry. From its various shipyards there is now turned out, we believe, as much shipping as is produced not only at all the other seats of the shipbuilding trade in the United Kingdom combined, but likewise in all other parts of the world.



CLEMENS' NEW MECHANICAL MOVEMENT FOR TRANSMITTING ROTARY MOTION.

can be seen at Section C 9, Machinery Hall, Centennial Exhibition, in connection with the exhibit of Mr. George V. Cresson, manufacturer of shafting. Parties desirous of ordering the coupler for the Middle States and Ohio address George V. Cresson, Philadelphia. For orders and Territorial rights for the Western and Southern States address the inventor, Melville Clemens, care George V. Cresson, Philadelphia, Pa.

An interesting exhibition has just been organized at the Simonetti Palace, on the Corso, in Rome, of a fire-resisting article of magnesia. This display of asbestos is in all the stages through which it passes from the time it is taken out of the earth until it appears as a manufactured article. The ancients had a means of weaving it, and with it made napkins for meals, wicks for lamps, and winding sheets for the dead for purposes of cremation, so that the ashes of the deceased could be collected

the United States. If the statue were meant to be a full gift from the French to the people of this country this would not be the case. It is, however, intended as a memorial, jointly erected by two nations that have many interests in common, of the struggles through which one passed at its beginning—aided to success by the other, and of the close of a century that has brought prosperity and a likeness in institutions to both. When France established her republic her statesmen and literary men looked to the United States for an exemplar of free government. They then learned of the approach of our Centennial year, and remembering the part of their country in our Revolution they were moved to take part in our festival. The Marquis Oscar De Lafayette, Marquis de Rochambeau, and MM. Laboulaye, de Tocqueville, and De Remusat first interested themselves in the project, and enlisted the sympathy of President Thiers and others. After some thought it was decided that M. Bartholdi, an eminent French sculptor, should visit this country and form some design for the expression in durable form of the mutual sentiments of the French and American peoples. M. Bartholdi, when he entered the beautiful Bay of New York was charmed, and while under its poetic influence conceived the design of a colossal statue of liberty, which should be a wonder in the sunlight, and a guide at night. He returned to Paris and reported to the committees there. His design was accepted. It was to erect a statue of the Goddess of Liberty, 80 feet in height, on a pedestal 45 feet high, the figure to serve as a lighthouse. Preparations to realize this design were retarded for several years by

of France. All classes responded quickly and the needed sum was procured within a few months. Some peasants and artisans subscribed even so small a sum as one sou each, and these contributions were taken with as much pleasure by the committeemen as the greater offerings of the richer classes, for they were accepted as thorough proofs of the sympathy of the entire population of France with the project.

Up to the present moment no subscriptions for the erection of the pedestal have been procured here. Some months ago a committee to raise funds, with Hon. John Jay at its head, was appointed by the Union League Club; but it has done no work which is known to the public. A committee for the same purpose is now in existence in Philadelphia, but it delays working until New York, in whose harbor the grand monument is to be placed, shall step into the van. In the meantime the design for the statue and pedestal has been changed. The height of the figure is to be 115 feet from its feet to the tips of the serrated coronet on its head, and the pedestal is to be about 80 feet from base to summit. The estimated cost of the figure is now 600,000 francs (\$120,000), and the pedestal must, of course, cost much more than at first expected. The failure hitherto of the people of the United States to enter heartily into the spirit of the project, is ascribed by M. Bartholdi and the French committee to their lack of knowledge of the real purpose of the monument—that of typifying the unity of two nations in devotion to freedom. These gentlemen have determined to delay soliciting more subscriptions from their countrymen until our



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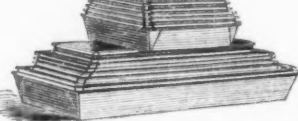
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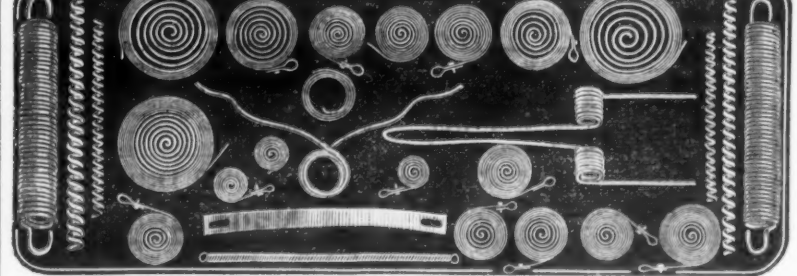
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bustion becomes perfect therefrom, all the carbon in the fuel being converted into a high and concen-  
trated heat, without smoke or gas, but that of carbonic acid, being formed. Beside a saving of fuel,  
obtainable in all cases by this blast, advantages arise from its varying according to the appliance of the heat.  
—On Forge Fires it gives a clean and intense heat, free from all sulphurous gas, whereby a better and  
quicker welding is had and time saved. On fires under boilers for making steam, the saving in fuel is 25 per  
cent. and over, the working capacity can be increased in same ratio by reason of the intensified and accel-  
erated combustion, which latter also overcomes the disadvantages connected with the use of fine dust  
and impure coal. Castings from a cupola in which the fire is sustained by this blast become of superior  
quality, uniformly soft to work and very tough, resembling wrought iron and steel; they forge hot  
and cold to some extent; the iron becomes strengthened and purified, being freed from carbon and sul-  
phur. For blast furnaces this process becomes of vast importance—it saves fuel, increases the work-  
ing capacity, perfects and reduces the cost of the metal, makes sulphurous and other impure ores fit for  
use. The serious drawbacks arising from imperfect combustion, caused mainly by otherwise uncontrollable at-  
mospheric influences, are overcome. The work of a puddling furnace and that of decarburizing the iron,  
steel purposes generally, is much simplified, shortened and perfected as to pur-  
ity of product; the work of so many hours is reduced to a few minutes by this process. The process  
has the merit of being simple and easily applied, and with very little expense, and this only for the  
needed chamber or vessel and its connection with the blast pipe; the vessel may be a wooden keg, barrel or  
larger cask or tank, properly lined, from two gallons for a single forge fire up to 500 gallons and over, according  
to the blast in use. The cost of the oxygen is conditioned by, and made subject to, its effect—it is but a small  
item compared to the gain from it. Although this process has been in practical use for over a year,  
the inventor felt reluctant to offer it to the public before having its utility and practicability fully estab-  
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# Limestone in the Manufacture of Fin- ished Iron.

We take the following from the *Iron and Coal  
Trades Review*:

An important discussion upon the utility  
or otherwise of limestone in connection  
with puddling various classes of iron, has  
just come off at a meeting of the Mill and Forge  
Managers' Association, of South Staffordshire  
and East Worcestershire; Mr. William Farn-  
worth, the president, in the chair.

Mr. Skidmore, who had himself worked it, was  
of opinion that with careful handling and a  
great heat, limestone, when puddling certain  
classes of pig, would improve the quality of the  
iron. Some few years ago he had met with a  
statement in one of Percy's works to the effect  
that in the manufacture of puddled bars lime-  
stone was injurious. He was prepared to con-  
tradict this, for in the case of a very lean pig he  
could produce a good fibrous bar when he used  
limestone. He had experimented with gray  
limestone from the Wren's Nest (near Dudley),  
and for a time a pair of squeezers was used to  
shingle the puddled ball. This machinery,  
however, was found to be wanting in power;  
the squeezers did not work with sufficient  
speed, and the old shingling hammer had to be  
resorted to. The heat of the furnace had to be  
very hot and quick. Limestone would not do  
when native pigs were used, for it would cause  
red-shortness. In the case of lean pig iron,  
limestone would assist the puddler, because the  
cinder would then be thicker, and when tapped  
would set sooner, and by adhering to the plates  
would save the bottom from burning. It also  
gave the puddler a sort of flux to help him in  
his next heat. If all mine pigs were used, the  
cinder would not have the advantage of adher-  
ing to the plates. The speaker went so far as  
to say that in his view the use of limestone  
added to the yield. Even quicklime, which he  
had also worked, did as much, though perhaps  
did not increase the fiber of the iron. He knew  
a firm who had used limestone for 25 or 30 years,  
and he contended that if, as was the case, they  
still used it, that alone was sufficient proof of  
its utility. When manufacturing cable chains  
this firm also used it with profit.

Mr. John Jenks considered the use of lime-  
stone for fettling was antiquated, though in  
the case of weak iron it might perhaps be  
used with advantage, but it would require  
great care. Some thirty years back when at  
an iron works in Shropshire, the wire rods  
turned out were very red-short. This de-  
fect was due to the use of limestone, and it  
continued so long as limestone was used.  
On several occasions when the iron was weak  
and cindery, the speaker himself had used  
limestone, and the effect was to make cold-  
short iron more fibrous. Only a short time pre-  
viously, too, he found that the iron was work-  
ing rather gray, and as there was at hand but  
one means of remedying it, he employed lime-  
stone. This experiment was attended with some  
degree of success, for it brought the iron  
forward sooner by thickening the slaggy cinder.  
Instead of limestone, a mixture of pottery  
mine, and oxide of iron and bulldog, might be  
used as a fettling, and he knew of instances  
where, in South Staffordshire, physicked cinder  
was being used as a fettling instead of either  
the one or the other.

Mr. Hughes thought that a great deal might  
be raised in the puddling furnace by employing  
a blast or something similar. If limestone was  
used it could not be left to the handling of the  
workmen; the forge manager would have to  
deal it out with much care. A certain portion  
of the limestone (that especially which was  
gray) might be profitably used with weak iron,  
but other portions of it were altogether unfit.  
Often when managers endeavored to help their  
puddlers they injured themselves. If a man was  
left to throw into his furnace as much scale as  
he liked he might turn out a good yield, but they  
all knew what would be the quality of his  
iron.

Mr. Barnett and Mr. Edwards both stated  
that when limestone had been employed the  
puddled ball often exhibited serious defects  
when under the hammer.

The president thought that this might  
perhaps be due to the impurities in the  
limestone, and not to the limestone itself. No  
doubt a perfectly good flux, the result in great  
part of a hot furnace, was very important. It  
would only take up a certain amount of cinder  
which it itself made from the iron, and assisted  
the puddler to some extent. The limestone  
being of a somewhat silicious nature it had  
nothing but the iron to act upon.

If bulldog was charged into the furnace with  
the limestone, Mr. Farnworth thought that  
a large amount of cinder would be got which  
would flux. He agreed with what Mr. Skidmore  
had said. The reason why limestone would be  
beneficial to a weak pig was because it at once  
came into contact with something of its own  
nature, and by further fluxing the iron made a  
richer product. If cinder pigs were used a good  
yield would be the result, but if lean-mine pigs  
were used the yield would be inferior. With  
reference to red-shortness, most of them knew  
that when the silica was extracted from rich ores  
the iron became red-short. This red-shortness,  
however, could be mastered by fagoting the  
iron over again.

Mr. Harris, though he had read many  
works on the subject, had yet only found  
one—and that was a Belgian work—written  
by a civil engineer in 1866, and published  
in America, which professed to give an ex-  
planation of the beneficial action which lime-  
stone, when used as a lining to the puddling  
furnace, had upon the iron produced. The  
publication said: "In lining the puddling fur-  
nace with limestone the limestone takes the  
place of the ferro-oxide, which being set free  
reacts upon the silicon and oxidizes it." The  
speaker was not prepared to say whether or not  
this opinion was correct, but it certainly seemed

to confirm the ideas which the other members  
had expressed, viz., that limestone was bene-  
ficial to lean pigs. He considered that the  
limestone got rid of the silica.

Mr. John Lester (the hon. sec.) said that  
not only had the members of the Associa-  
tion to contend against the silica contained  
in the fettling, but also against the evil  
which attended the charging of the fur-  
nace with pigs that always had round them  
more or less sand, which was almost pure  
silica. This sand they knew adhered to the  
pigs when they were run out of the blast fur-  
nace into the sand beds; and in the puddling  
furnace tended to impart to the iron turned  
out cold-shortness rather than red-shortness.  
Iron thus produced would be spilly or dry, and  
would not weld properly. One of the chief  
causes of red-shortness was the presence of  
sulphur, and of cold-shortness the presence of  
phosphorus. Absence of silica would be one  
reason of the red-shortness.

The president remarked that red-shortness  
generally was no doubt due to the richness of the  
iron, but in the case of lean pigs, where limestone  
was employed, it would be the result of a want  
of cinder in the iron, and to its being so very  
dry.

The only reason Mr. Rigby could see why  
lime improved the iron was that it made a more  
powerful flux. Lime by itself would not melt  
very readily, but when oxide of iron and silica  
were added, a good flux was produced. As to  
limestone increasing the yield he should attrib-  
ute that fact to the better class of pigs used at  
one time than at another, and not to the lime-  
stone itself. The presence of magnesium in  
some qualities of limestone was a great evil  
against which they had to contend, and it was  
to this that he attributed the fact that some  
limestone was inferior for use in the puddling  
furnace to other. In the North of England he  
had worked limestone, but he admitted that the  
iron produced never had a good welding prop-  
erty. It was always red-short. The ends of the  
rails used to drop off as they were put through  
the rolls. He questioned the utility of lime-  
stone. It might do when the product was nail  
sheets or other qualities of iron that would not  
require reheating; but for iron that had to be  
again put in the fire by the blacksmith, it was  
of little, if any, service. If a large quantity of  
lime was in the flux it was present, in a more  
or less degree, in the iron. The lime was not  
easily reduced to calcium; and what was  
wanted was something which would prevent  
the iron from absorbing the oxygen when it  
was being welded. If limestone benefited iron  
at all, it was because by bettering the flux it  
caused a glassy cinder, and by imparting to the  
iron a fibrous nature increased its strength.  
The flux should be thoroughly melted; and one  
firm had, ever since he could remember, used  
clay of an aluminous nature as a flux. Clay of  
a silicious nature would not do.

Mr. Healey was of opinion that it was not the  
immediate action of the limestone upon the iron  
that gave them an advantage in the using of it,  
but that combinations which tended to purify  
the iron were formed more easily when lime was  
used than when it was not. It would not make a  
better yield, but the impurities would congre-  
gate more readily. It must not, however, be  
forgotten that an accurate test could only  
be obtained by very carefully watching the  
furnace from the time when the charge be-  
came molten until it was ready to ball. A  
certain quantity of iron would have to be  
taken out of the furnace every two or three  
minutes and examined. His own impression  
was that the use of lime would get rid of the  
silica, phosphorus, and sulphur, which were  
so objectionable.

A member here said that some iron which  
had just been worked under his direction  
was sufficiently liquid when molten to de-  
stroy any fettling. He could not get any  
fettling to stand it. None of the pigs used  
were of Staffordshire make; but about a month  
ago he had experimented with Staffordshire  
pigs in the same way, but even then he could  
get no fettling sufficiently refractory. In each  
case after the first heat he not only had the cin-  
der out, but hoisted through the bottom of the  
furnace. Notwithstanding this, he was so  
well pleased with the beneficial effect of the  
lime that he should not give up his experiments  
till he found a lining that would stand the  
intense heat. The iron turned out made  
first-class hoops, strip, small rod, and bars;  
and this from the worst Staffordshire  
iron he could find. In three out of four  
instances the yield was excellent. He could not,  
however, say that at present it was a com-  
mercial success, because in each case a new set  
of bottom plates would be required.

Mr. Healey considered that one of the advan-  
tages in the using of lime was that as soon as  
it became free it readily took up with the  
phosphorus in the pig iron, and the result was  
a phosphate of lime.

The president thought that limestone, when  
used as a fettling would benefit the iron by not  
giving off its carbonic acid until it became  
somewhat oxidized.

Mr. Rigby, however, was of opinion that the  
carbonic acid would be given off as soon as the  
lime became red-hot.

The president said that if that was the case,  
the iron would derive no benefit whatever from  
the limestone.

The Association hesitate at present to pro-  
nounce a definite opinion on the subject. At  
this stage of the investigations which are being  
conducted, the general view entertained seemed  
that limestone is not useful in connection with  
the puddling of iron, except in special cases,  
and then great care must be exercised. So im-  
portant, however, is the subject to the malle-  
able iron industry, that it was understood that  
the experiments would be continued, and, in  
the light of these additional experiments, the  
question be further discussed on a future occa-  
sion.



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R., NEW YORK.</p> <p><b>B. F. JUDSON,</b> Importer of and Dealer in SCOTCH AND AMERICAN <b>Pig Iron,</b> Wrought &amp; Cast Scrap Iron, English and American <b>HORSE SHOE IRON, &amp;c.,</b> 457 &amp; 459 Water St., } NEW YORK. and 235 South St., }</p> <p><b>P. W. GALLAUDET.</b> Banker and Note Broker, Nos. 3 and 5 Wall Street, NEW YORK. HARDWARE, METAL, IRON, RUBBER, SHOE, PAPER AND PAPER-HANGINGS, LUMBER, COAL, AND RAILROAD PAPER WANTED. ADVANCES MADE ON BUSINESS PAPER AND OTHER SECURITIES.</p> <p><b>ALLIS, BULLARD &amp; CO., Limited.</b> Railway and Machinists' Supplies. Machinery and Metals. Specialty made of Second-Hand Iron Working Machinery. 14 DEY STREET, NEW YORK.</p> <p><b>STEEL STAMPS.</b> LETTERS, FIGURES, &amp;c., Of every description and for all purposes. Best Work, Lowest Prices. <b>RICHARD H. ROGERS,</b> 45 Ann Street, (Rear), - - - New York. Orders by mail promptly attended to.</p> <p><b>NAME PUNCHES.</b></p>	<p><b>IRON.</b> NEW YORK.</p> <p><b>HARRISON &amp; GILLOON</b> <b>IRON AND METAL DEALERS,</b> 508, 560, 562 WATER ST., and 302, 304, 306 CHERRY ST., NEW YORK. have on hand, and offer for sale, the following: Scotch and American Pig Iron, Wrought, Cast and Machinery Scrap Iron, Car-Wheels, Axles and Heavy Wrought Iron, also old Copper, Composition, Brass, Lead, Pewter, Zinc, &amp;c.</p> <p><b>OXFORD IRON CO.,</b> <b>Cut Nails and Spikes,</b> R. R. Spikes, Splice Bars and Nuts and Bolts, 81, 83 &amp; 85 Washington, near Rector St, N. Y. <b>JAMES S. SCRANTON, Agent.</b></p> <p><b>BRADLEY, REIS &amp; CO.,</b> NEW CASTLE, PA., Manufacturers of every description of <b>PLATE &amp; SHEET IRON</b> Office, 22 Cliff Street, N. Y.</p> <p>ESTABLISHED 1840. <b>PETER TIMMES' SON,</b> Manufacturer and Galvanizer of Wrought, Ship, Boat, Dock &amp; R. R. SPIKES, RIVETS, NAILS, &amp;c. Nos. 281, 283 &amp; 285 N. 6th St., Near junction of N. 2d St., Brooklyn, E. D.</p> <p><b>BURDEN'S</b> <b>HORSE SHOES.</b> "Burden Best" Iron Boiler Rivets. Burden Iron Works, H. Burden &amp; Sons Troy, N. Y.</p> <p><b>Pottsville Spike, Bolt and Nut Works.</b> G. D. ROSEBERRY, Pottsville, Pa. Manufacturer of <b>RAILROAD SPIKES</b> <b>MINING SPIKES,</b> Cold Pressed Nuts, Machine Bolts &amp; Bolt Ends.</p> <p><b>THOMAS J. POPE &amp; BRO.</b> <b>BORAX</b> Of Finest Qualities. METALS. 292 Pearl Street, near Beekman, N. Y. Anthracite, Charcoal and Scotch Pig Irons, Ingot Copper, Lead, Bismuth, Tin, Antimony, Aluminum, Spelter, Nickel, &amp;c., &amp;c.</p> <p><b>GRATE BAR</b> "ECONOMY." GEO. VANDERBILT, Sole Agent. Especially adapted for burning Pea Coal, Pea and Dust, and other fine material. Office, East West 19th Street, New York.</p> <p><b>RANCOCAS FACING MILLS.</b> J. W. PAXSON &amp; CO., 514, 516, 518 Beach St., Phila., Proprietors. Also Dealers in <b>FOUNDRY SUPPLIES,</b> And all Grades of <b>MOULDING SAND.</b></p> <p><b>WHITEHEAD BROS.,</b> Office and Retail Yard, 517 WEST 15TH STREET, NEW YORK. Dealers in all grades NEW JERSEY, NORTH RIVER, CRESCENT AND ALBANY <b>MOULDING SANDS.</b> Also FIRE SAND, FIRE CLAY, KAOLIN and all kinds of <b>FOUNDRY FACINGS.</b></p> <p><b>BAEDER, ADAMSON &amp; CO.</b> Manufacturers of <b>SAND &amp; EMERY PAPER &amp; EMERY CLOTH.</b> (Also, in Rolls for machine work.) Ground Emery, Corundum &amp; Flint, Glue &amp; Curled Hair, Hair Felt, &amp; Felt- ing for Covering Boilers, Pipes, &amp;c., Cow Hide Whips. STORES: PHILADELPHIA, 730 Market St., NEW YORK, 67 Beekman St., BOSTON, 143 Milk St., CHICAGO, 182 Lake St.</p>	<p><b>IRON.</b> PITTSBURGH.</p> <p><b>PENNSYLVANIA IRON WORKS.</b> <b>EVERSON, MACRUM &amp; CO.</b> Pittsburgh, Pa., Manufacturers of every description of <b>Bar, Sheet and Small Iron,</b> Make a specialty in <b>Fine and Common Sheet Iron.</b></p> <p><b>W. P. TOWNSEND &amp; CO.,</b> Manufacturers of <b>WIRE and</b> <b>Black and Tinned Rivets</b> OF CHOICEST CHARCOAL IRON. Rivets any diameter up to 7-16 inch and ANY LENGTH required. 19 &amp; 21 Market St., PITTSBURGH PA.</p> <p><b>A. G. HATRY,</b> Manufacturers' Agent and Broker Bar, Sheet, Tank, Boiler, Angle, T, and Railroad Iron, Nails &amp; Spikes, Steel &amp; R. R. Supplies. PITTSBURGH, PA.</p> <p><b>SHOENBERGER &amp; CO.</b> Manufacturers of the <b>JUNIATA</b> <b>Horse &amp; Mule Shoes</b> <b>NAILS AND SPIKES,</b> <b>Horse Shoe Bar,</b> AND <b>SHEET IRON.</b> Goods warranted equal to any in the Market. Send for Circulars in regard to "PICKED NAILS." Cor. 15th and ETNA STREETS, PITTSBURGH, PA.</p> <p><b>BOSTON ROLLING MILLS</b> Manufacture Extra quality small Rods, from best selected Scrap Iron. <b>SWEDISH AND NORWAY SHAPES,</b> Nail and Wire Rods. Also, <b>Horse Shoe Iron, Hand Made</b> <b>Horse Shoes &amp; the Boston</b> <b>Horse Shoe.</b> BOSTON ROLLING MILLS, W. R. ELLIS, Treas. Office, 17 Battery March St., Boston.</p> <p><b>"PEMBROKE"</b> Round, Square &amp; Flat Iron. <b>"FRANCONIA" Shafting &amp; Bar Iron.</b> Extra quality when great strain or superior finish is required. Also, Irons for ordinary work, like the "ENGLISH REFINED." <b>WM. E. COFFIN &amp; CO.,</b> No. 8 Oliver Street, Boston.</p> <p><b>ASA SNYDER,</b> Importer of Scotch, and Furnace Agent for the cele- brated Anthracite and Hot and Cold Blast Charcoal <b>PIG IRONS.</b> OFFICE AND YARD: 1008, 1010, 1012 and 1014 Cary Street, Richmond, Va. Orders for Scrap Iron filled.</p> <p><b>OSCAR BARNETT,</b> <b>Malleable &amp; Gray Iron</b> <b>FOUNDRIES.</b> NEWARK, N. J.</p> <p><b>CUTLER &amp; BROWN,</b> Shippers and Dealers in all grades of <b>MOULDING SAND.</b> FIRE SAND, FIRE CLAY &amp; KAOLIN. Also, manufacturers and dealers in <b>FOUNDRY FACINGS and SUPPLIES.</b> Office, 288 Cherry Street, N. Y. Sand Banks at Albany: Retail Yard, 454 Cherry Street Factory, 218 &amp; 215 Cherry Street. GEORGE W. CUTLER CLARENCE J. BROWN</p>
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## Iron.

PHILADELPHIA.

**T. Horace Brown,**  
IRON, METALS & MINERALS,  
205½ Walnut St., PHILADELPHIA.

AGENT FOR  
Bechtelsville Iron Co.,  
Wood Bros.' Charcoal Blooms & Billets  
Virginia Bessemer Ore Co.

**H. L. GREGG & CO.,**  
Ship Brokers & Commission Merchants,  
Importers of  
Old Iron, Metals and Rags.

Freight engagements made to all parts of the world.  
Marine insurance effected in reliable offices.  
108 Walnut St., Phila.

## THE CAMBRIA IRON WORKS,

Situated on the line of the Pennsylvania Rail road,  
at the western base of the Alleghany Mountains, are  
the largest of their class in the United States, and  
are now prepared to make

1800 TONS PER WEEK,

Of Iron and Steel Railway Bars.

The Company possesses inexhaustible mines of  
Coal and Ore, of suitable varieties for the production  
of Iron and Steel Rails of

## BEST QUALITY.

Their location, coupled with every known im-  
provement in machinery and process of manufacture  
enable them to offer Rails, when quality is con-  
sidered, at lowest market rates.

The long experience of the present Managers,  
of the Company, and the enviable reputation  
they have established for "CAMBRIA RAILS,"  
are deemed a sufficient guarantee that purchasers can,  
at all times depend upon receiving rails unsurpassed  
for strength and wear by any others of American or  
foreign make. Any of the usual patterns of rails  
can be supplied on short notice, and new patterns of  
desirable weight or design will be made to order.  
Address,

CAMBRIA IRON COMPANY,

218 S. 4th St., PHILADELPHIA.  
or at the works, JOHNSTOWN, PA.

## Siemens' Regenerative GAS FURNACE.

**RICHMOND & POTTS,**  
119 S. Fourth St., PHILADELPHIA, PA.

## W. D. WOOD & CO.'S



## PATENT

## Planished Sheet Iron.

Patented March 14th, 1865; April 8th, 1873;  
Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.

Guaranteed fully equal in all respects to the  
**IMPORTED RUSSIA IRON,**  
and at a much less price.

**FOR SALE,**  
by all the principal

## METAL DEALERS

In the Large cities throughout

## THE UNITED STATES.

And at their Office,

111 Water Street PITTSBURGH, PA.

## Spooner & Collins,

COMMISSION AGENTS,

## PIG IRON

Blooms, Bar, Sheet &amp; Hoop Iron.

409 N. Third St., (Room No. 6), St. Louis.

## THE PHOENIX IRON CO.,

410 Walnut Street, PHILADELPHIA.

Manufacturers of

## CURVED, STRAIGHT AND HIPPED Wrought Iron Roof Trusses, Beams, Girders & Joists.

and all kinds of Iron Framing used in the construction of Iron Proof Buildings.

DECK BEAMS, CHANNEL, ANGLE AND T BARS

curved to template, largely used in the construction of Iron Vessels.

## PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,

For Top and Bottom Chords of Bridges.

Railroad Iron, Street Rails, Rail Joints and Wrought Iron Chairs.

**REFINED BAR, SHAPING, and every variety of SHAPE IRON made to Order.**  
Plans and Specifications furnished. Address,

SAMUEL J. REEVES, President.

## V. G. HUNDLEY.

79 Reade Street, New York. Agent for



## North Carolina Handle Co.,

(WILSON &amp; SHOBER, Proprietors.)

Manufacturers of **SPOKES, AXE, PICK, SLEDGE, HAMMER, HATCHET** and other  
Gondies. Full assortment always on hand.

## Iron.

## J. & J. Rogers Iron Co.,

AUSABLE FORKS,

Essex Co., N. Y.

Manufacturers of

## FINE CHARCOAL Blooms & Bars

For Conversion into Cast Steel.

ALSO,

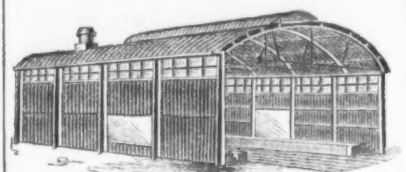
## Horse Shoe, Round Square and

FLAT IRON,

Exclusively from Palmer Ore.

Agents:

Merritt Trimble, 21 Platt St., N. Y.  
John Moorhead, Pittsburgh, Pa.



Wrought Iron Buildings, Wrought Iron Bridges, Cor-  
rugated Iron Roofs, Shutters, Doors, Flooring, &c.  
Corrugated sheets of all sizes manufactured by Monsey  
Iron Bridge and Roof Co., No. 3 Dey St., N. Y.

## Bonnell, Botsford & Co.,

## Iron, Nails & Spikes.

YOUNGSTOWN, OHIO.

## OLD DOMINION

## Iron and Nail Works Co.,

RICHMOND, VA.

**R. E. BLANKENSHIP,** Commercial Agent,  
Manufacture

## NAILS AND BAR IRON.

Bands, Scrolls, Horse Shoe Bars, Nut and  
Rivet Iron, Spike Rods, Shunting, Bridge  
Bolts, Ovals, Half Ovals, Half Rounds, &c.

## Notice to Manufacturers of Fruit Can Trimmings.

The superior quality and cheapness of the produc-  
tion of my **PATENT FRUIT CAN TRIMMINGS** (Patented April 6, 1875), having induced  
certain parties to infringe my patent, I have com-  
pelled them to cease manufacturing, and I will pro-  
ceed against any one who may infringe in the future.

## The Very Best FRUIT CAN TRIMMINGS,

(3 1-2 Inch Opening.)

Are manufactured under process patented April 6,

1875, at the

## WOODBURY STAMPING WORKS,

WOODBURY, N. J.

I am making arrangements to the end that at least  
one prominent house in all the principal cities of the  
United States will keep a supply of my trimmings,  
for the trade.

**J. M. PATTERSON,**  
Sole Manufacturer,  
WOODBURY, N. J.

Samples furnished free upon application ac-  
companied by business card.

## JOHN CARVER,

Manufacturer of

## Caulking Irons,

## COTTON, FREIGHT & Hay Hooks, &c

288 Monroe Street, NEW YORK.

With Dieston's Saws.



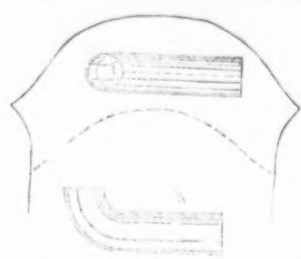
Sold by Hardware Trade.  
**LANGDON MITRE BOX CO.,**  
Send for Circular. Millers Falls, Mass.

## New Patents.

We take the following abstract of new  
patents, recently issued, from the official re-  
cord:

## SHEET METAL ELBOW.

To **Andrew Syverson**, Chicago, Ill.—Aug. 8.—  
The blank is adapted to form an elbow with  
one seam, and that in the length of its shortest  
curve, and with metal of a uniform thickness.  
1. The blank A of uniform thickness, adapted

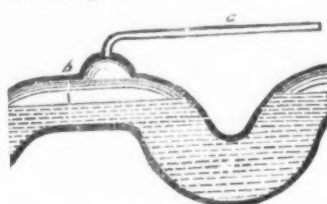


to form the elbow by being constructed sub-  
stantially as specified.

2. The sheet metal elbow, made of a single  
blank of sheet iron of uniform thickness, hav-  
ing a single longitudinal seam, the elbow be-  
ing formed without crimping or cutting, and  
presenting a smooth surface throughout when  
finished.

## SEWER GAS TRAP.

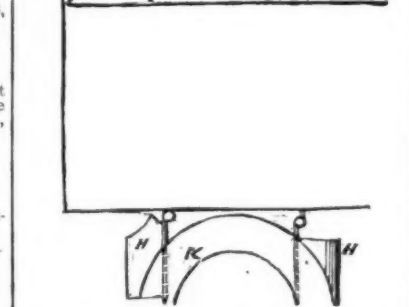
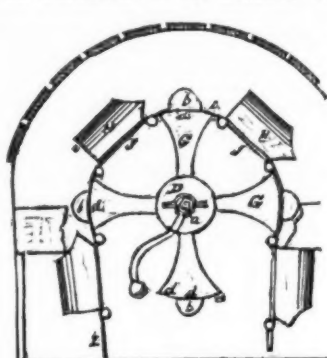
To **John M. Falk**, New York, N. Y.—Aug. 8.—  
The two traps have an intermediate escape pipe  
for the sewer gas.



1. A waste pipe, B, provided with two con-  
nected traps, A D.  
2. The combination, with a waste pipe, B, of  
an escape pipe, C, for gas, located between  
traps A and B in said pipe.

## WATER ELEVATOR AND PURIFIER.

To **Thomas T. Bishop**, Atlanta, Ga.—Aug. 15.  
—The combination of the elevating wheel,



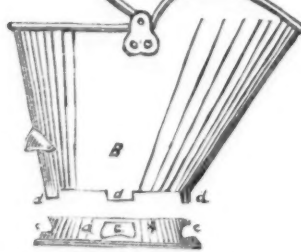
composed of the hub D, with radial shouldered  
arms G, having rounded tenons b; the endless  
chain, composed of the alternate slotted plates  
I and solid plates J hinged together; the  
buckets H, provided with vents z and secured  
to the solid plates J, and the flanged wheel K.  
180,755.—Radiator.—George Curtis and W.  
Thompson, Bridgeport, Conn.—Aug. 8.

180,766.—Ladle, &c.—Charles P. Housum,  
Decatur, Ill.—Aug. 8.

The handle can be secured at a right or any  
intermediate angle by the thumb screw.

## BOTTOM FOR COAL ROD.

To **George F. Sawyer**, Albion, N. Y.—Aug. 15.



—The combination of the bottom A, apertures  
ccc, lips d d d and body B.

180,791.—Laundry Furnace.—George W. Rob-  
ertson, Peekskill, N. Y., assignor to South-  
ard, Robertson & Co., New York city.—  
Aug. 8.

180,811.—Soldering Iron Heater.—John H. Whit-  
ling, Salem, Ohio.—Aug. 8.

The pipe that connects the reservoir and il-  
luminating burner passes through the furnace.  
The heat causes the oil to vaporize.

180,814.—Wash Stand.—William H. Zinn, Bos-  
ton, Mass.—Aug. 8.

A wash stand combining a wash bowl and a  
water tank, with apparatus for pumping the  
water from the tank into the bowl.

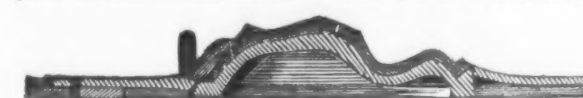
180,817.—Eaves Trough Hanger.—Jonathan P.  
Abbott and Henry W. Triasler, Cleveland,  
Ohio.—Aug. 8.

180,917.—Combined Stone Pipe Thimble and  
Register.—Charles Pettit, Erieville, N. Y.,  
assignor to himself and L. P. Greenwood,  
same place.—Aug. 8.

The top and bottom plates are provided with  
openings to allow the air to pass. The bottom  
has a register, and the top may be provided with  
a ring to cover the openings.

## CASTING DIE PLATES.

To **Jos. B. McCune**, Hamilton, Ontario, Cana-  
da.—Aug. 15.—Casts a pattern plate by first  
casting a bed plate around which to cast the pat-  
tern plate. The bed plate is cast in a mold made  
by interposing between the sections of a two  
part mold a layer or stratum of sand, thereby



producing a cavity or mold immediately over  
or in addition to the pattern or pattern cavity.  
After the bed plate is cast the stratum of sand  
is removed and the pattern plate cast, occupy-  
ing the space made around the bed plate by the  
removal of the sand.

The process, herein described, of forming  
pattern plates from the pattern itself by first  
forming a pattern bed and casting metal directly  
around and in contact with the same.

180,946.—Coal Oil Stove.—Norman H. Sher-  
burne, Chicago, Ill.—Aug. 8.

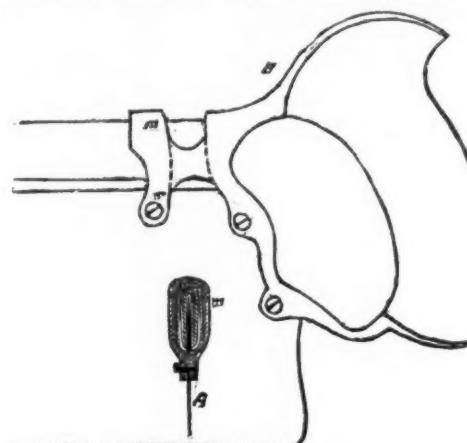
The steam generated in the reservoir is dis-  
charged into the chimney of the burner. The  
jacket is provided at its base with openings for  
the admission of air, which is heated and  
passes out through openings in the top of the  
perforated cap against the vessel thereon.  
180,968.—Faucet.—James O. Waddell, Newark,  
N. J.—Aug. 8.

7254.—Hot Air Furnace.—Reissued.—Orange  
N. Hart, Winona, Minn., assignor to George  
T. Flint, same place.—Patent No. 92,822,  
dated July 20, 1869.—Aug. 8.

The gas burner or air feeding device can be  
placed at various distances from the fire. The  
deflector spreads the smoke in the exit flue,  
which is wider than the fire-box.

## HAND-SAW.

To **Henry Diston** and **Chas. T. Shoemaker**,  
Philadelphia, Pa.—Aug. 22.—The back and  
blade of a hand-saw are secured together by a  
clamp, forming part of the handle, or formed  
of a separate piece or pieces of bent metal.

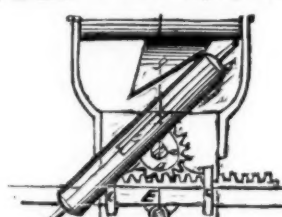


1. In a back-saw, the combination of the  
blade A and back B with clamp m, by which  
the said blade and back are secured together.

2. The combination of the blade, back and  
handle of a hand-saw with a clamp m forming  
part of the handle.

## BELT SHIFTER.

To **A. Crosby**, Benton, Me.—Aug. 15.—By  
moving the rack bar, the roller attached to the  
sector is made to bear obliquely against the



edge of the belt, causing it to run from one  
pulley to the other.

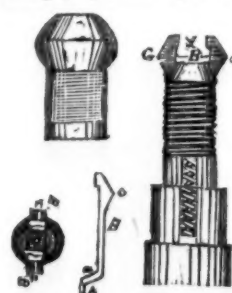
The combination of the roller C, frame b,  
sector D, rack E.

## DEVICE FOR HOLDING BITS AND OTHER TOOLS.

—REISSUED.

To **Miller's Falls Company**, Miller's Falls, Mass.,  
assignee, by mesne assignments, of J. Ernest  
Barber, administrator of Wm. H. Barber, de-  
ceased. Patent No. 42,827, dated May 24,  
1864; reissue No. 4736, dated Feb. 6, 1872.—  
Aug. 15.

Bits and analogous tools can be securely held  
without any previous fitting to the holder, by  
means of a socket having a rectangular taper-  
ing bore to receive the shank of the bit; a pair  
of jaws having projections upon their upper



outer surfaces, recesses in their confronting  
faces, and angular lower ends, terminating in  
short tangs, and a threaded sleeve nut, having  
an enlarged internal chamber inclosing the  
jaws.

1. The jaws B B, constructed substantially  
as and for the purposes specified.

2. The enlarged chamber Z, in combination  
with jaws having projections c and z.

3. The threaded socket, provided with a rec-  
tangular tapering bore, in combination with a  
chambered sleeve nut, and jaws having projec-  
tions c and z.

4. The combination of a threaded socket,  
having a rectangular tapering bore, a sleeve nut  
acting in the direction of the handle, and com-  
panion jaws working in slots which prevent  
lateral displacement, said parts co-operating  
to grasp and center the bit, and also fasten the  
shank firmly in the tapering bore, the jaws tak-

ing hold upon the stem of the bit below its  
shank.

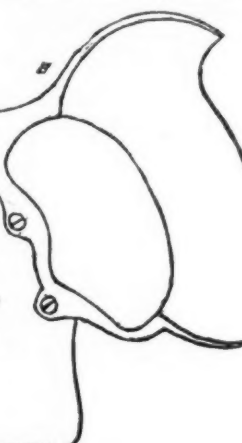
5. In combination with the loose companion  
jaws of a bit holder, a spring applied at their  
non-grasping ends to automatically open the  
jaws.

180,989.—Spring Hinge.—Ira Buckman, Brook-  
lyn, E. D., N. Y.—Aug. 15.

The central plate of a three-part double-  
acting hinge, re-enforced at its edges, and  
furnished with an unequal number of knuckles  
on its opposite side, serves, by alternating  
its position in a series of the attached  
hinges, to regulate or adjust the torsion  
of the connecting spring, the power of  
the spring being so transmitted from the  
knuckle of the center plate of the middle hinge  
to the knuckles of the top and bottom leaves  
of the upper and lower hinge that all the leaves  
are rigidly held to the center plates by the ac-  
tion of the springs.

181,237.—Steam Boiler and Setting.—T. R. But-  
man, Milan, Ohio.—Aug. 15.

The water fire boxes diverge from a point  
below the grate to a point above, where  
they converge and join the boiler near the  
top, the upper portion forming a "curve  
crown." The hot air pipes pass over the top  
of the boiler to a heating drum at the rear,  
forming a division in the rear flue, and pipes  
lead the air to a "hollow calorific wall,"  
through which it is distributed in the furnace  
under the boiler. The steam is superheated  
and air heated by the waste products of com-



bustion passing over the boiler to the uptake.  
The bridge wall slopes downward, by which  
the heat is deflected from the center of the  
boiler.

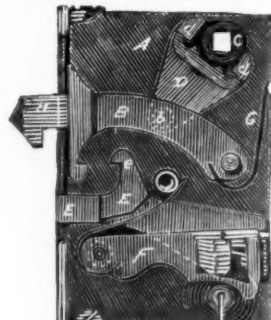
181,262.—Hydraulic Elevator.—Milton P. Hig-  
gins, Worcester, Mass.—Aug. 22.

The two water services of different heads,  
in connection with the valve having a cylindri-  
cal case with perforated ports, and controlled  
by an endless cord, with a suitable arrangement  
of pulleys, gives a steady and uniform motion  
to the elevator carriage.

## LATCH AND LOCK COMBINED.

To **W. H. Taylor**, Stamford, Conn.—Aug. 15.

—1. In combination with the pivotal bolt B,  
provided with a spring, G, the tail piece D,  
pivoted to the bolt at a point intermediate be-



tween its fulcrum and its locking end and the  
hub C.

2. In combination with the pivotal bolt B,  
pivotal tail piece D, and hub C, the sliding  
bolt E, and tumblers F, for securing the bolt B  
in the locked position.

The following design was patented during  
the week ending Aug. 8:

9435.—Ash Boxes.—Andrew Schmitt, Williams-  
burg, N. Y.—Term of patent 3½ years.

181,050.—Chimney Cowl.—J. M. Davies, Enon  
Valley, Pa.—Aug. 15.

The oblong exit section acts as a vane.

181,145.—Chain Pump.—James S. Corbin,  
Laurel, Ohio.—Aug. 15.

181,224.—Cooking Stove Attachment.—Theo. R.  
Timby, Tarrytown, N. Y.—Aug. 15.

A portion of the shelf is cut away, so that it  
shall not cover the pot hole. The shelf is sup-  
ported from the hearth plate, the pivot passing  
through the top plate.

The following trade-mark was registered dur-  
ing the week ending Aug. 15.

3331.—Lantern.—Hurricane Patent Lantern  
Company, New York, N. Y., and Jersey City,  
N. J.

"The word symbol 'Hurricane' "



## Iron.

CLEVELAND.

## Cleveland, Brown &amp; Co.

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NORWAY NAIL RODS,

NAILS, SPIKES,

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WINDOW GLASS,

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Chairs, Rivets, Nuts, Washers, and Heavy Hardware Generally,

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Exclusively for the Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags & Coal for Practical Metallurgical Purposes.

No. 339 Walnut Street, Philadelphia.

J. BLODGET BRITTON.

This Laboratory was established in 1866, at the instance of a number of practical iron-masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

## CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in an ordinary Ore..... \$4 00

For the per cent. of Pure Iron, Sulphur and Phosphorus in do..... 12 50

For each additional constituent of usual occurrence..... 1 50

For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.

For determining the per cent. of Sulphur and Phosphorus in Iron or Steel..... 14 00

For each additional constituent of usual occurrence..... 6 00

For the per cent. of Carbonate of Lime, and Insoluble Silicious Matter in a Limestone..... 10 00

For each additional constituent..... 2 00

For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal..... 12 50

or determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal the charges will correspond with those for the constituents of an ore.

For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.

Printed instructions for obtaining proper average samples for analysis furnished upon application.

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Special attention given to analysis of Iron and Steel.

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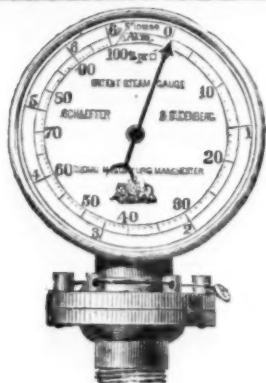
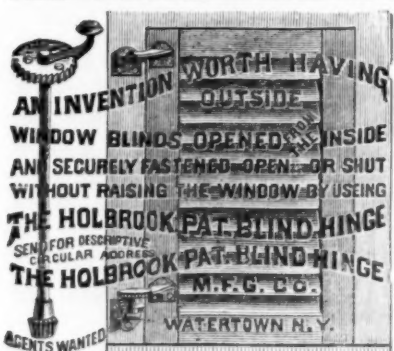
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W. HEUERMANN, 4 Cedar Street, NEW YORK.

## Iron.

## THE

## MILWAUKEE IRON CO.

Manufactures and Offers For Sale

## MERCHANT BAR IRON.

Flat Bars up to 6x2. Rounds and Squares up to 4 inch, Ovals, Half Ovals, Half Rounds, Box Iron Cylinder Bars, Plow Beam Iron, &c. Also, Hoop, Band, Horse Shoe and Shafting Iron of superior quality. A full assortment in store after February 1st.

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Fish Plates to fit all rails used in the West. Track Bolts made from Iron of superior quality. A large stock on hand. New patterns made promptly.

## CAR LINKS AND PINS.

All patterns kept in store or made to order. Link and Pin Iron in stock.

## CAPACITY OF WORKS FOR 1876.

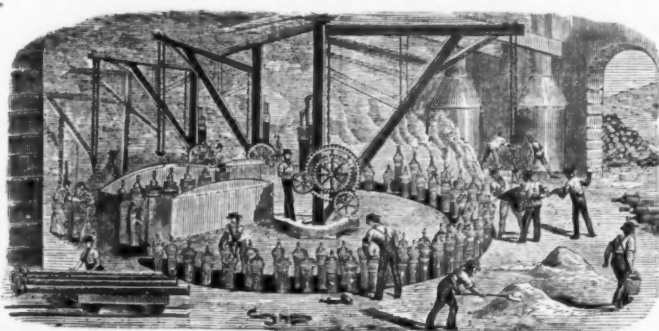
Merchant Bar Iron	20,000 tons.
Pig Iron	35,000 "
Railroad Iron	40,000 "
Railroad Splices and Couplings	5,000 "

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ANGLE and T IRON, BOILER and TANK RIVETS, Lap-Welded Iron Boiler Tubes, Wrought Iron Steam and Gas Pipes.

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ESTABLISHED IN 1840.

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Iron Fronts, Stair Girders, Lintels, Columns, etc

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## HAND-CUT FILES &amp; RASPS.

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Send for Price List.

## H. S. MANNING &amp; CO.,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S

Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Beam, etc. also of Solid Bolt and Pipe Dies. Furnished either in V or U. S. Standard shape of threads.

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SPRING STEEL AND WIRE of all kinds,

HORSE SHOES, TIRE, AXLES and other Forgings.

Boiler Plate, Galvanized &amp; Black Sheet Iron, Corrugated Roofing &amp; Siding of Siemens-Martin, Bessemer Steel &amp; Iron.

All made from our own Lake Superior Ores.

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Having introduced New and Improved Machinery into their Rolling Mills, and manufacturing all their Iron from the ore, and also doing all Machine Work and Repairs in their own shops, they are enabled to produce

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Of all Patterns and of uniform quality, unsurpassed for strength and wear, and of any required length.

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**PENNSYLVANIA CORUNDUM CO.'S** Corundum in Casks and Packages.

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Manufactured and for sale by

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## SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. Silver Medal awarded at the Great Fair of American Institute last autumn. We make more than 30 styles.

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Will roast 30 to 40 lbs. at once, and can be used as a stove at other times.

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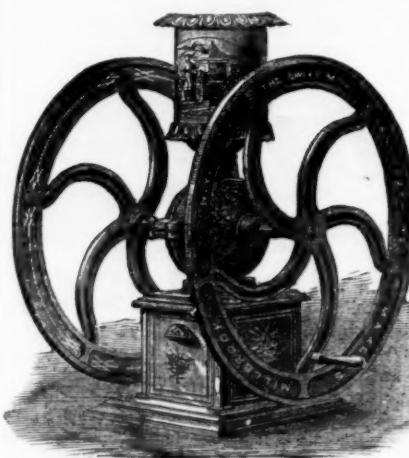
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No. 16.



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Important for all Large Corporations and Manufacturing Concerns.

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**CAUTION.**—The public are notified that in my suit against Imbueuser & Co., of New York, a decree was made in my favor, June 10, 1874.

Proceedings have been commenced against said Imbueuser & Co., for selling clocks contrary to the order of the Court, and specially the clock with a series of springs in the cover, and marked "Patented Oct. 20th, 1874." All persons discovered using these infringing clocks will be dealt with according to law.

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LOOSE PIN REVERSIBLE,

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GEORGE B. NEWTON, Agent. Shipments by Rail-  
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Caution.—As certain parties are offering for sale  
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is on every package. None other genuine.

## Gold Leaf and its Manufacture.

The trade of the gold beater is one of those least known to the public, and at the same time there are few things more commonly used for decorative purposes than gold leaf, almost fabulous quantities of the leaf being used in finishing, lettering, gilding edges and otherwise adorning books. The humblest muslin binding has at any rate its title in gold letters, and on the bevelled and costly bindings of annuals and holiday works gold leaf is no slight item of expense. The sign painters and fancy workers use large quantities. In describing the process of making gold leaf a correspondent of the *Sun* says:

For the dentist is made not only a special article, chemically pure, but cunning processes elaborate the foil after it has reached the minimum of tenuity, into a soft, spongy mass, which can be deftly punched into the remotest cranny of a tooth. For him little golden cylinders are spun out of flossy webs, that he may counteract the effects of taffy or the neglect of the early tooth brush, and for his use are made little spongy nuggets, that look like solid cubes, but which roll up between the fingers into golden pellets.

Entering a gold beating establishment, the visitor's attention is first attracted by the din of 20 or 30 hammers, weighing from 8 to 18 pounds apiece. The men resemble so many blacksmiths at the anvil, except that their blows are less rapid and the strokes more measured and regular, and there is more rebound to the hammers. Without changing the monotony of the stroke, the gold beater shifts his hammer from one hand to the other, and turns the little bunch of skin on which it descends first to one side and then to the opposite one, and then back again, for he cannot pound steadily in one place—his packet must be kept in motion.

The ingot of gold comes from the mint in shape, perhaps, 5 inches long, 1 inch wide, and not quite so thick. It must first be alloyed for color, for fashions prevail in gilding as in everything else, and leaf varies from almost white yellow to a deep golden color. Silver is employed to lighten and copper to darken it. Having received the alloy, it is recast into nearly the same shape it had at the mint, and then the thinning process begins. It is put between iron rollers, being annealed each time it passes through until it has become a ribbon some 7 yards long. When this degree of tenuity is obtained, the ribbon, then about an inch and a half in width, is cut into squares, and placed in the "cutch." The cutch is a book 3 inches square, containing leaves made of a peculiar kind of paper, partly animal and partly vegetable, the composition of which is a secret. These cutches are imported from London, where alone the best are made. In the cutch the gold is beaten with a hammer weighing 14 or 15 pounds, until the square of metal reaches the edge. This generally takes about half an hour. The workman then, with a tool called a wagon which is not unlike a sled with one runner sharpened, cuts the leaf into four parts. Each of these new squares is then placed in the "shoulder," which is simply a collection of loose leaves, about 4 inches square, made of the intestines of the ox, prepared in a way which is a trade secret. The edges are wrapped in vellum, and tightened with a strip of reed, and here the leaf is beaten again with an eight pound hammer for two hours and a half, when it is ready for the "pack," or goldbeater's skin. Goldbeater's skin is made of the caecum of the ox. It is well cleansed and the mucus surfaces are doubled together and made to firmly adhere. The skin is then tanned and it is pressed and dried and cut into leaves five and an eighth inches square. Eight hundred and fifty of these leaves make the book or pack, and in its preparation the caeca of five hundred bullocks are used. The skin is semi-transparent before being beaten, and in color is not unlike raw hide or a drum head. It will stand furious beating, but tears in one's fingers as easily as a sheet of letter paper.

After the pack has been through a hundred and fifty beatings it is sold to the maker of Dutch or bronze metal, who pays about \$20 for it. Between each beating the skin is rubbed with talc, roasted and powdered, which removes greasiness and renders the gold less liable to break. In the process of beating the pack is worked repeatedly in the hands, that is, bent in every direction to equally distribute the heat generated by the hammer and to prevent the gold's adhering to the skin. The acquirement of skill in this molding or bending process is obtained only after long practice, and it is part of the goldbeater's art. A blunder would destroy the pack and render useless the work already done to the gold. As the metal is beaten out to the edge of the skin it is removed and again cut in four pieces with the wagon. The pieces are replaced in the pack and again hammered to its edge. The process is repeated until the gold is of the required thinness. The hammer used in the final beatings is of about seven pounds weight. It is slightly convex on its face, and the art of the beater is so to work that the center shall at all times be the thinnest part of the leaf; and while he must hammer all parts in such an equal manner that the original square shall grow slowly toward the edges, the thickest part must be always at the outside and fall among his waste. Here is where practice and the experience of a light hand doing heavy work tell. Of fifty pennyweights in gold in the ingot seventeen is the return in leaf, the rest being in scrap.

The English method of beating ordinary commercial gold leaf is to anneal an ingot in hot ashes to remove the grease, and then run it between highly polished steel rollers until it is one eight-hundredth of an inch in thickness, an ounce of gold then making a ribbon 10 feet long and 1 1/2 inches wide. It is then annealed again and cut into squares weighing 6 grains. One hundred and fifty of them are beaten in fine calf skin vellum to squares of 4 inches.

These are quartered, and the squares again beaten and quartered. They are beaten again in the pack, and the squares are then 2400 in number. After the next beating an ounce of gold has been made to cover 100 square feet of surface, and at this stage it begins to transmit green rays of light. Repeated beatings reduce it to the average thickness of one two hundred thousandth part of an inch. The French process begins with forging the gold upon anvils, and beating it with small hammers to the thickness of one-sixth of an inch, instead of putting it through the rollers of polished steel. It is then beaten as above described. The average of French commercial gold leaf is one two hundred and eighty thousandth part of an inch.

The leaf after being beaten is given to the charge of girls, who have before them paper books, each 3 1/2 inches square, and containing 25 leaves. The leaves are rubbed over slightly with red ochre, and are made by an old German in Lewis street, who has a monopoly of the business and supplies the trade of the United States. The workwoman opens the pack, and with a pair of wooden pliers, partly like chopsticks and partly like sugar tongs, deftly spreads a leaf on a leathern cushion in front of her, blows it smooth, and, with a larger wagon than the one in use before, and having two sharpened edges instead of one, cuts it into an exact square, the ragged edges of leaf falling through a slide into a leathern pocket below, for future collection and smelting. Any holes or breaks are patched dexterously with loose pieces, which adhere instantly, and are then transferred to the little paper book. These books are filled for 2 1/2 cents each, and a fair day's work is 60 books. The books complete, each containing 5 1-10th grains of gold leaf, are packed 20 books to the bundle, and are worth about \$8 a bundle.

Foil for dentists' use differs from gold leaf in not being beaten so thin. Gold leaf has alloy in it to color it, but dentists' foil must be chemically pure. A large establishment must add to its other departments a refiners' fire and appointments, where it is made as pure as possible. It is then beaten. The dentist, however, requires the foil to be in a spongy state, which is effected by putting many leaves of foil between paper in a press, and then exposing the whole to such a degree of heat that the paper is entirely carbonized, shrinks in surface, and taking the gold with it, gives it a finely corrugated appearance. Many sheets of this are laid together and cut into shape.

Dutch metal or bronze is not made in this country, but is imported from Germany, and costs about ten cents a book. It is composed of tin, copper and other metals, and is a very good imitation of gold, but it does not stand weather well, is apt to tarnish and peel, and side by side with the real leaf, is easily distinguished. It is largely in use for frames for auction pictures and for decorations where gold leaf would be too expensive.

Gold has been beaten to the thinness of one three-hundred and sixty seven thousand five hundredths of an inch. In Pliny's time an ounce of gold was made into "750 leaves four fingers square." Martial speaks of gold leaf as a vapor, and Lucretius compares it to a spiders' web.

## Prize Engine Running.

We condense the following account of a competitive trial between engine drivers from the *Engineer*. We have more than once had occasion to call attention, in our columns, to the importance of this subject. The remarks made about the ignorance of English engineers are applicable in a much less degree to those of our own country. It has often been pointed out that a little time and money spent in teaching engine men and stokers how to perform their duties would be well laid out. It will, of course, be understood that we do not refer here to men already trained, such as the engineers in charge of heavy engines, or the stokers who have charge of the stationary boilers used in large manufacturing.

But the number of steam engines of small, or comparatively small power in use in Great Britain alone is enormous, while the ignorance of the men who have charge of them is extremely dense. The loss incurred by the proprietors of such engines and the employers of such men is much more considerable than will, perhaps, be readily believed. Even nominally the best men would be the better of a little practical instruction, as is proved by the fact that within the last few months the consumption of fuel on the Brighton Railway has been reduced by, we believe, about 3 lbs. per mile, as a result of first pointing out to the firemen of the line the faults usually committed by them in firing, and then taking care that these faults are avoided. Probably the most incompetent engine drivers or firemen in the kingdom are those placed in charge of portable engines, and to the improvement of this class we wish to direct attention. Although it is true that they are generally selected from among the ordinary laborers on a farm, it must by no means be supposed that they are incapable of acquiring instruction. The defects in their practice are the results more of ignorance than of anything else, and this ignorance must continue to exist until they are supplied with the means of learning how to do better, while an adequate stimulus is held out to them to induce them to improve themselves. How this is to be done must be left very much to the judgment of employers, but much good may be effected by the system of holding competitions and offering prizes for the best man. As an example of what may be accomplished in this way, we shall give here some account of competitions recently held in Kent under the auspices of local agricultural societies.

The Sittingbourne Agricultural Society held their annual sheep shearing match at Cuckoo

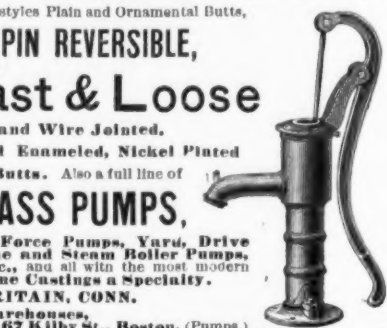
Court on the 22d of June. Taking advantage of this meeting, the society offered prizes for the best driver of a portable engine. The first prize was £3 and a silver medal, and the second and third prizes consisted each of £2, 10/ and a silver medal. The tests were carried out in the following way: An 8 horse-power agricultural locomotive was provided. This engine was fitted with a friction brake, such as is used by the Royal Agricultural Society, and a counter. The brake was loaded to 22.5 horse-power. The engine was handed over successively to the different competitors, 21 in number. Each man was supplied with 210 lbs. of coal and 8 lbs. of wood, and as much oil and tallow as he required was weighed out to him, the quantities being carefully noted. He was then left to fire and drive as he pleased, without interference, except to warn him that he was running his engine too fast or too slow. The standard of efficiency was the number of revolutions got out of the engine. Without going into details we may say that after five days' work the four best men competed a second time, the result being that the first prize was awarded to John Waters, who got 13,967 revolutions out of his engine; the second prize to J. Snashall, with 13,396 revolutions, and the third prize to J. Gardiner, with 13,258 revolutions. Turning to the log sheets we find the following comments by the judges, Messrs. R. J. Sankey and Thos. Aveling. Against Waters we have: "Tubes swept; cylinder lubricated often, and engine oiled; damper closed; reversing lever maintained by a small wedge just behind fifth notch. Coals well broken and wetted; pressure very regular at 90 lbs. to 95 lbs.; firing very good, ashes burned." Very nearly similar entries were made by the judges for the two other prize men, from which it appears that they understood what they were about. We may call special attention to the use made of his expansion gear by Waters, who, finding that he could do a little better with the link in one place than in another, compensated for the want of sufficiently minute divisions in the sector of the reversing lever by weighing the latter just where he wanted it.

We may be asked what all this amounts to, and what is proved by the fact that Waters ran off 13,967 revolutions? The actual running time was 91 minutes; the mechanical time was 33 minutes, and consumption of fuel was 6.45 lbs. per brake horse-power per hour. Now, it must be borne in mind that none but tolerably good men, men with some reputation as drivers, competed. If we turn to the log of the man who did worst during the trial, we shall see what the difference between good and bad firing and driving comes to. The smallest number of revolutions obtained was 7943, the running time being 59 minutes only; the mechanical time was just under 53 minutes, and the consumption of fuel was consequently over 11.3 lbs. of coal. This is to say, that Gardner used nearly twice as much coal per horse per hour as Waters. Gardner's driving seems to have been unsatisfactory throughout. The reversing lever was frequently changed from one notch to another, and the damper was altered several times, the speed of the engine was very irregular. We have thus the plainest possible evidence that the saving which can be effected in fuel by a skilful man is a very important item in the economy of engine power. Waters used in round numbers 1 cwt. of coal less per hour than Gardner, or in a day of 10 hours, say half a ton of coal, which he can hardly value at less than 7/6. Any farmer who paid Waters 2/6 a day more than he paid Gardner would thus effect a saving of 5/4 a day, say nothing of the fact that the less fuel an engine uses the less will be the wear and tear, and the smaller the bill for repairs.

We are pleased to find that the competitive system is extending throughout Kent. In June the Gravesend and Rochester Agricultural Association carried out a very similar series of trials at Oakley, Higham. Three prizes were given of £10, £5 and £4, with silver medals, to the engine driver "who has kept his engine in good working order, and is able to produce the greatest amount of steam-power from a given amount of coals." The conditions of the competition were exactly the same as at Sittingbourne. The first prize of £5 was awarded for 10,137 revolutions; the second prize, also £5, was awarded for 10,127 revolutions—practically a tie—and the third prize, £4, was awarded for 10,076 revolutions. In order that the competitors might acquire some practical instruction, the firm who built the engine sent a trained driver of their own to show what could be got out of the engine by proper management. He succeeded in getting 12,743 revolutions out of the engine, thus beating the first prize man by some 25 per cent.

## Prize for Purifying Illuminating Gas.

An interesting competition is about to be opened by the German society *Verein von Gas und Wasser Fachmannern Deutschlands*, which offers a prize of \$400 to the author of the process for the economical purification from carbonic acid of illuminating gas obtained from coal. The systems now commonly employed involve either hydrate of lime, certain salts, muriate of manganese, for example, and iron oxides. Whether these methods leave more or less to be desired according to the nature of the coal distilled, or whether the forms of purifiers are imperfect, it is nevertheless certain that carbonic acid still remains present in illuminating gas, and its presence is decidedly unhealthy. Either a new system for its complete removal or an effective improvement on the older processes is required. The invention must be economical, easy of manipulation, and must not lower the illuminating power of the gas. The memoir describing it must be complete, and explain both the theory and the practice. Manuscripts must be signed with some distinctive device, which is to correspond with a similar mark on a sealed packet in which is written the name and address of the author. Communications are to be addressed to the president of the commission, Dr. Schilling, at Munich, prior to December 31, 1876.



The Largest Pump Works in the World.  
Over 800 Different Styles  
PUMPS, STEAM PUMPS, ROTARY  
PUMPS, CENTRIFUGAL PUMPS,  
PISTON PUMPS,  
for Tanners, Paper Mills, Fire Purposes, suitable for all  
situations imaginable.



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General Agents for the Pacific Coast.  
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## Geo. M. Eddy & Co.,

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Are made of best steel

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Light, practical, durable,

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Has no competitor

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Orders for full trade should be made early.

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Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

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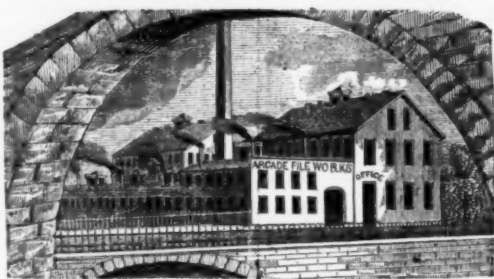


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Made from Best  
**ENGLISH CAST STEEL.**  
Quality guaranteed by written warranty  
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**Horse Rasps  
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made from the very best American Steel, all cut by hand, and warranted to give entire satisfaction. If requested, we will send sample lots, to be returned or held subject to our order, free of all charges, if not found as represented. All Rasps not stamped as the annexed incorporated trade mark are not genuine. Sold by Hardware dealers generally.

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Best Cast Steel.  
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**MATTEAWAN**

**John Rothery's**

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**MADE FROM ENGLISH CAST STEEL.**

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**Putnam's Government Standard  
FORGED**

**Hammer Pointed  
HORSE SHOE NAILS,  
READY FOR DRIVING.**

Manufactured from the best of NORWAY Iron,  
and warranted to give entire satisfaction.

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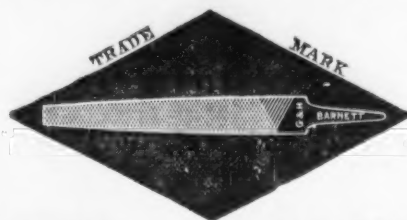
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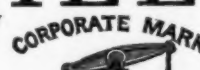
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**CAST, SHEAR & BLISTER  
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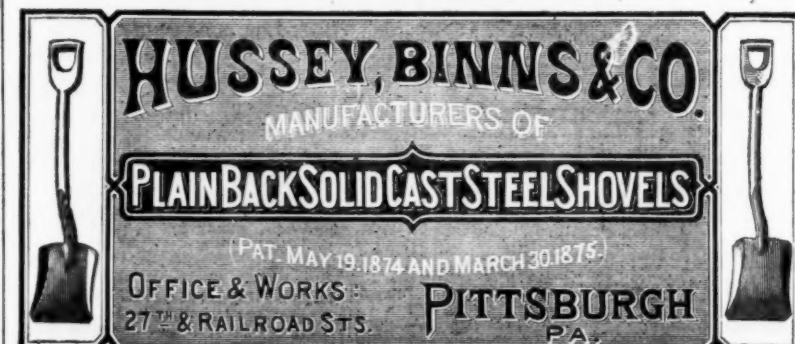
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**CHARLES B. PAUL,**  
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SOLID CAST STEEL GOODS MADE TO ORDER.

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SUPERIOR SWEDES IRON TACKS, for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

**American and Swedes Iron Shoe Nails,**

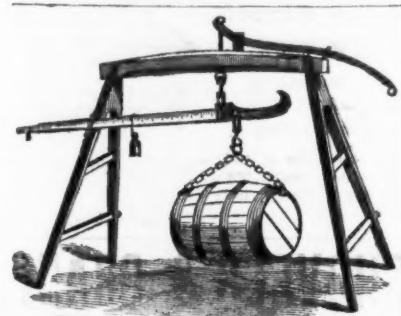
Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads, Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails.

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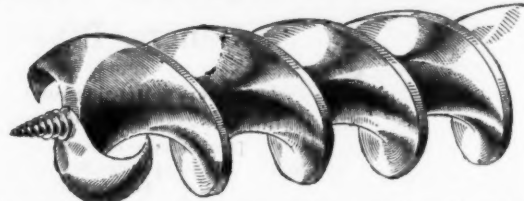
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**CLARK & CO.'S**  
PATENT  
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NOISELESS  
**STEEL SHUTTERS**  
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FIRE AND BURGLAR PROOF.  
Also, SELF-COILING  
**Wood Shutters**  
In various kinds of wood, suitable for Store Fronts,  
Private Houses, Offices, and School Partitions.  
**The Best & Cheapest Shut-**  
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All Real Estate owners are invited to inspect them at  
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162 & 164 West 27th Street, New York.  
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Champion Centennial  
MATCH SAFE.  
Exposing one match at a time.  
Plain, \$50 per gross.  
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Agents wanted in every  
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For Tin, Japan Ware, Safe and Carriage Manu-  
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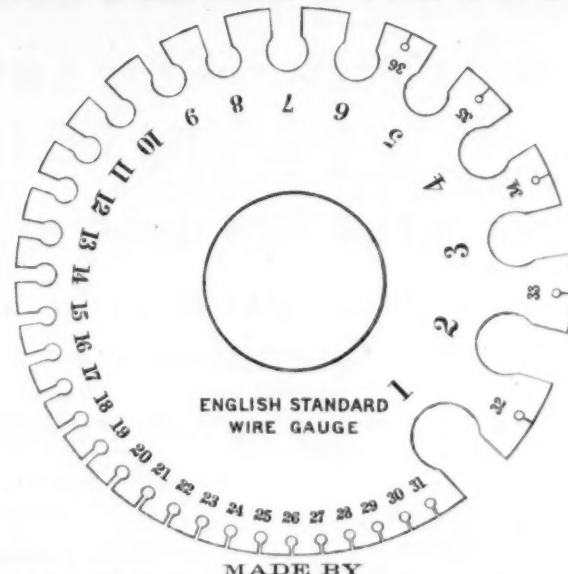
These goods have been in use over twenty years. We have reduced our List Price of Cook's Augers and Bits. Discounts remain unchanged.

Chisels, Gouges and Drawing Knives of all kinds, Screw Drivers,  
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Boring Machines, Chisel Handles, Wood Boxes, Tool Chests.

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**THE HURRICANE FORGE.**  
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Also Stationary Forges.  
Large Size, superior to stone or brick. Can be used with bel-  
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## English Standard Wire Gauges



**DARLING, BROWN & SHARPE, Providence, R. I.**

**RHODE ISLAND HORSE SHOE CO.,**  
OFFICE, 81 Canal Street, Providence, R. I. WORKS at Valley Falls, R. I.  
Manufacturers of  
PERKINS and RHODE ISLAND PATTERNS of  
**HORSE AND MULE SHOES.**

### BUSINESS ITEMS.

#### MASSACHUSETTS.

Some 75 hands have just been discharged from the Waltham Watch Factory, and it is feared others must go.

#### CONNECTICUT.

The strike of the grinders and finishers in the Connecticut Cutlery Shop, at Naugatuck, has assumed considerable importance, and is causing a good deal of feeling between the employers and employees. A few days ago a man having a minor son who understands finishing and grinding, allowed him to go to work, and that noon he found a letter in his hat demanding that he take his son out of the shop, under penalty of all kinds of horrible things.

Frederick Meyers, one of the striking molders formerly employed by Sargent & Co., of New Haven, was fined \$15 and costs, amounting to \$25.66, for assaulting Hiram Smith, an apprentice at the factory. Judge Blydenburgh spoke a few words to the strikers present, in which he gave them to understand that the next man arrested for a similar offense would be more severely dealt with. Myers took an appeal to the Superior Court. Mr. Sargent has offered a reward of \$3000 for evidence that will convict the 30 persons who have threatened or intimidated workmen employed by him. He threatens to close his entire works unless his men are protected from the strikers.

#### NEW JERSEY.

The Andover Iron Company will not blow in at present.

#### PENNSYLVANIA.

The Sharon Herald claims for Mr. Walker, of the Western Furnace, the credit of first using waste gas in drying out a furnace. If he will look over our files he will find that Mr. Benj. Crowther, of the Isabella furnaces, is the one to whom this credit is due.

Keel Ridge Furnace, Sharon, will soon be ready. One of the hot-blast ovens is finished. This will be 14 feet 6 inch boshes; 6 feet 3 inch crucible; and a bell top, 8 tuyeres.

Valley Furnace (Stewart) No. 2, Sharon, blew out Saturday, the 16th, after a blast of about 10 months. It is the intention, we understand, to blow No. 1 in as soon as the stock house is repaired and a new roof put on the casting house.

Westerman Furnace No. 1 blew in on the 20th. The furnace is open top, 7 tuyeres.

Spearman Furnace No. 2, Sharpsville, was blown out on Tuesday of last week, after a very successful blast. No. 1, which has been fitted up with a bell-top, was to have blown in last week.

The Bloomsburg furnaces are running to their fullest capacity.

The Berwick Rolling Mill started in full operation last week.

The New Castle Courier says: An effort to make a reduction in the workmen's wages at three furnaces, Thursday morning, viz.: Rosena, Red Jacket and Aetna, resulted in a strike. The men were put to work again at the Rosena and Red Jacket, but the Aetna will blow out.

Ground has been broken at Marietta for the erection of new hollow-ware buildings upon five lots facing on the Pennsylvania Railroad above the station. The building will be entirely of frame, the dimensions of which are: Foundry, 40x70 feet; main building, 50x175 feet. The new corporation will be styled the "Marietta Hollow-ware and Enameling Company," and the following officers have been elected: President, James Duffy; treasurer, J. Z. Lindemuth; general manager, E. L. Reinhold; secretary, G. F. Stibgen.

The Aetna Iron Works, New Castle, have been idle for some time to allow of putting in new foundations under rollers, squeezers, and a new fly-wheel pit. Will be in operation in about two weeks.

#### PITTSBURGH AND VICINITY.

The American Iron Works, on the South Side, are turning out 170 tons of rails for a passenger railway in Milwaukee, Wisconsin.

Evans, Sell & Co., glass lamp chimney manufacturers, will start up on Monday.

The iron mills of Messrs. Lloyd & Black, on Second avenue, suspended operations in all departments last week. Want of orders and dullness of trade is reported to be the cause of the suspensions. A large number of men are thrown out of work in consequence.

The mills of Zug & Co. are now in full operation, running the bar mill single turn and the nail mill furnaces double.

The Union Chain and Cable Company are establishing an enviable reputation for their chain. They have added largely to their machinery, and confidently expect a large trade.

The Pittsburgh Forge and Iron Company are running single.

#### WEST VIRGINIA.

The Riverside Nail Works are again in operation.

The Wheeling Intelligencer says: Messrs. Trimble & Hornbrook, the plumbers, are now turning out some of the heaviest gun metal castings ever made in the State. Twelve of the castings are for boxing the journal bearings of the new engine for the Benwood Mill. Four of them weigh 460 pounds each, and eight of them 175 each. This firm are also making other miscellaneous castings for the same engine, which, including the above, will make an aggregate of 3500 pounds for the one engine.

The Belmont and Top Mill nail factories, Wheeling, were temporarily shut down last week.

#### KENTUCKY.

The Kentucky Stock Bell Factory, Louisville, can scarcely keep up with its orders.

The Louisville Plate Glass Factory is running full time and force, and yet orders are accumulating.

The Louisville Scale Manufactory, of Zahn & Rankin, report increased activity in their

line, and a growing demand for their superior work.

#### GEORGIA.

Ward's Furnace, at Cartersville, is still making high percentage ferro-manganese, using about 500 bushels of charcoal to a ton of iron; but then the product is worth from \$120 to \$140 per ton.

#### TENNESSEE.

The Chattanooga Iron and Steel Company put fire under the boilers and started the machinery for the first time on the 16th.

#### ALABAMA.

The Eureka Furnace, at Oxmoor, makes about 30 tons of pig iron per day, which find a ready market at remunerative prices. The new furnace, now being built, will have a capacity of 80 tons of iron daily. All the machinery used is of the latest improved kind, and the heat from the coke ovens is utilized to redden the blast ovens and generate steam that propels the machinery, nothing being allowed to go to waste. The company employ 250 persons.

#### OHIO.

We clip the following from the Iron Age Commercial of the 16th: "The three furnaces, Alice, Belfont and Ironton, are now in blast; the latter, using native ore exclusively, is making an excellent quality of iron. The Iron and Steel Company's Mill is running all their rolls, but orders are slow in coming in. The Lawrence Mill is running steadily. Orders, however, are light; customers who formerly purchased 200 tons now send in orders for only 25 and 30 tons at a time. The company are building up a good Southern trade, and before the season closes the mill will have manufactured enough ties to bind 50,000 bales of cotton. The Belfont Nail Mill is now running full turn. There is still a large stock of nails on hand, and orders are not as large, or so frequent as they might be. Lambert & Gordon, machinists, founders and boiler makers, are now working about 85 men, finishing up their contracts for Princess Furnace in Boyd county, Ky., and the Dunbar Furnace in Fayette county, Pa. It is rumored that efforts are being made to organize a company to build a stove foundry upon the site of the Ironton Foundry, which was burned down in July last."

The Falcon Iron and Nail Company, of Niles, have started a nail keg factory in connection with their other works.

Mr. Joseph Fletcher, boss roll turner at the Cleveland Rolling Mill Company's Works, Cleveland, is now engaged turning a set of rolls for the purpose of rolling concave bars, with which to manufacture horseshoe nails at the new works, near the plate mill. The full quota, when finished, will consist of one set and two pair, for a regular guide mill train.

The Union Iron Works Company are running both their mills at Newburgh on full time, and full handed. Orders are not what might be wished, and prices are unsatisfactory.

Bourne & Knowles, nail and bolt manufacturers, are running quite actively, but could do more.

The Cleveland Rolling Mill Company, at their wire mill, are turning out about fifty tons of steel wire as compared with thirty tons last year. This embraces every variety of wire, and is shipped to all parts of the country. The company are now employing from 2800 to 3000 men in the various Newburgh mills.

#### INDIANA.

From a circular received from the newly organized Ohio Falls Car Company, Jeffersonville, we learn that they are now prepared to furnish promptly, and at low prices, all classes of passenger and freight cars, car wheels and car castings and forgings.

The Aurora Iron and Nail Company start their nail factory this week, beginning with 16 machines, all self-feeders.

#### MICHIGAN.

The old small mill at Wyandotte has been torn down and the new building is nearly framed. The engine is also being removed and will be replaced by one of greater power.

The Morgan Furnace is having a good run at present, averaging about 22 tons per day. There are about 100,000 bushels of coal braze on the bank, and it is being screened for use, which will be a good saving in the way of fuel. The furnace is now using one-fifth braze. About 50 men have been put to work chopping wood and burning coal, and the prospects are that the furnace will run all winter.

L'Anse is somewhat excited over the prospect of a blast furnace being built in that place. John R. Case, Esq., formerly manager of the Champion Furnace, has been looking up the inducements to be offered for the erection of a blast furnace.

The following table shows the total shipments of iron ore from the Lake Superior district this season, up to and including Wednesday, Sept. 13, together with the shipments for a corresponding period last year, as reported in the Marquette Mining Journal:

Where From.	1875.	1876.
From Marquette.....	336,743	345,641
From Escanaba.....	169,253	245,099
From L'Anse.....	49,786	61,951
Total.....	555,782	652,691

Showing an increase of 96,909 gross tons.

The rail mill at Wyandotte was lighted up on the 17th for a two weeks' run on orders received from the Toledo & Maumee and Canada Southern Railways.

The blast furnace of the Eureka Iron Company blew in late Monday night, 18th, and the first cast was made Tuesday evening. The repairs on the furnace have been very thorough, and it is expected to turn out on an average of 20 tons a day. It has just received orders for 250 tons of iron. Fifty tons were for the Detroit Stove Works, and the remainder for Cleveland dealers.

The Wyandotte Courier says: The docks have presented quite a lively appearance for the last week, considering the time. On Tuesday the bark Sunnyside and schooner City of Tawas laid at the Eureka dock with large cargoes of ore, while at the rolling mill docks were the propeller Atlantic, throwing off old rails, and the schooner Fred. L. Wells with 200 tons of coal.

#### ILLINOIS.

The Belleville Nail Mill will start again about Oct. 1st. This mill has been idle for over nine months, and has been leased by Jas. C. Waugh & Bro. for a term of years.



Any Dealer is aware that in an ordinary Hand Saw, the front cut is the effective cut, and drawing back the Saw has little effect, by reason of the slant edges riding over the fiber as the Saw is drawn back. The difference between the front cut of a Hand Saw, and the back cut, is the difference between the Lightning Saw teeth and all others; for all other saws are set one point and ride on slant edges. By setting two points of my M the same side, and the next two the other, I conceal the slant between them, and operate wholly by the outside of a nearly vertical M tooth. Standing nearly vertical the two points of the M occupy the same space as one old V tooth. One point only is cutting and the other follows in the silt behind it to cut in the same manner, in the return motion, thus doubling the cut upon the same base and space of tooth. This construction also gives the breadth and durability of nearly an inch of steel instead of a single slender scraping point, and presents the upright instead of the slant edges to the timber. Any one can in a moment test the principle by comparing the front and back cut of any V tooth Hand Saw. My new Patent of March 28th, 1876, allows the saw-dust perfect clearance; the arch slightly widening to the points of teeth renders it impossible for green or resinous saw-dust to be retained, while the slightly increased breadth at base of tooth gives the durability so much advocated by parties who have round-edged files for sale. Slightly pyramidal, the outer edges are as upright as the front cut of a Hand Saw, and the back slant cut is concealed in no other saw than mine, by setting the two points of M to cut in line instead of alternately. Thus by this new patent I avoid all "overhang or undercut," avoid all tearing, and to the matchless speed of the Lightning dress and set, add the durability, simplicity of sharpening, and sweet cutting so much admired. I thus adapt the Lightning teeth to universal use, in all Hand, Pruning, Buck, and Cross-Cut Saws. The concave in the centre of the M saves files, and renders it impossible to file the tooth out of shape. A 10 inch Cut File and Set fitting the M is furnished for forty cents, that will file ten saws easily.

A 16-inch log was sawed off in 17 seconds by hand with a Lightning Cross-Cut Saw, at Pennsylvania State Fair, on September 30th, 1874, before President Eby; W. B. Lawson, S. S. Hoagland, and other officers of the State Board, timing.

\$1000 challenge to any responsible saw manufacturer, to match the Lightning Saws, in speed of cutting and ease of sharpening. This patent saw tooth has recently been vindicated by U. S. Court decreeing cost and damages for infringements. Beware.



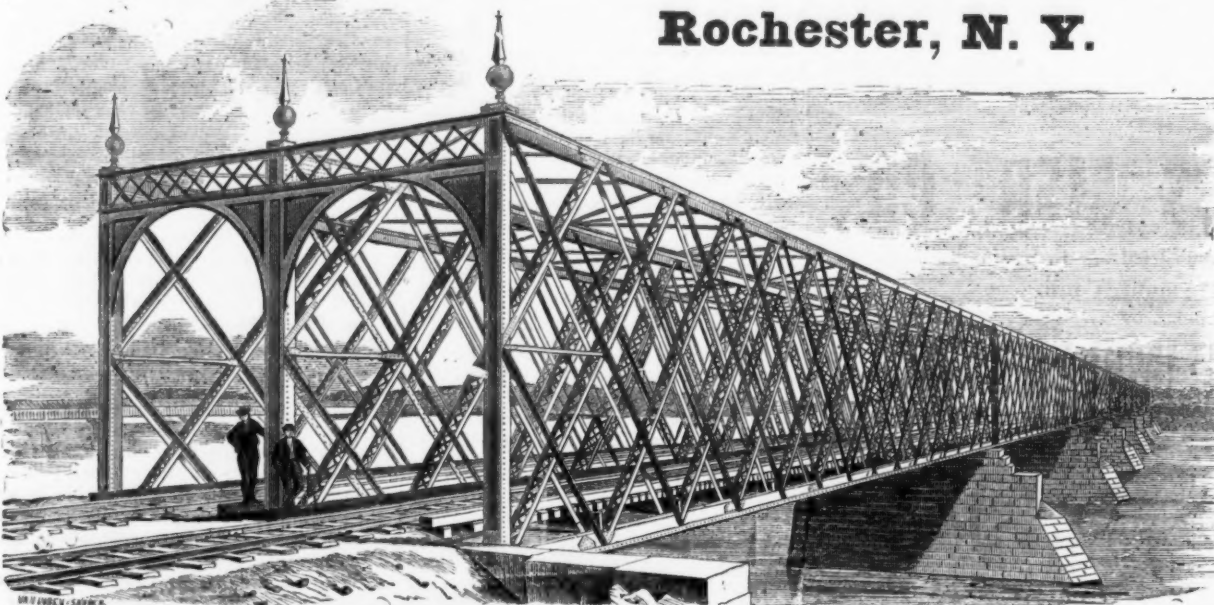
STORE AND WAREHOUSE, No. 90 Beekman Street, N.Y.

PHILADELPHIA OFFICE, near Corlies Engine, Machinery Building, Centennial.

**TRIAL OF THE IMPROVED LIGHTNING SAW.**—The EMPEROR, Don Pedro, accompanied by Director-General Goshorn, Superintendent Albert and others, visited Machinery Hall, at the Centennial, on the evening of June 28th. Among other things inspected, at the invitation of E. M. Boynton, of New York they witnessed a trial of the new Lightning Saw, patented March 28, 1876. Two men with one of these saws cut off a sound log of gum wood, one foot extreme diameter, in seven seconds, or at the rate of a cord of wood in five minutes. Messrs. Corlies, Morell, Lynch and other members of the commission witnessed the trial and timed the cutting. The Emperor remarked that was fast, very fast cutting. Last evening the Emperor made another examination of the saw. Philadelphia Press, June 30.

Boynton's saws were effectively tested before the Judges at the Philadelphia Fair, July 4th and 5th. An ash log 12 inches in diameter was sawed off, with a 4 1/2 foot Lightning cross saw, by two men, in precisely six seconds, as timed by the chairman of the Centennial Judges of class 15. The speed is unprecedented, and would cut a cord of wood in four minutes. The Representatives of Russia, Austria, France, Italy, Spain, Belgium, Sweden, England, and several other countries were present, and expressed their high appreciation.

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Wrought Iron Riveted  
Lattice Railroad

AND  
HIGHWAY BRIDGES.

Wrought Iron  
WATER PIPE.

The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders Solicited from Civil Engineers and Contractors.

[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

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Established 1843. Manufacturers of FIRST QUALITY

## SPRINGS & AXLES

And Beer's Patent Curtain Rollers, Concealed Hinges, Etc., Springs of any pattern made to order. Send for Circular and Price List.

**P. & F. CORBIN,**  
Manufacturers of BUILDERS' & MISCELLANEOUS HARDWARE.



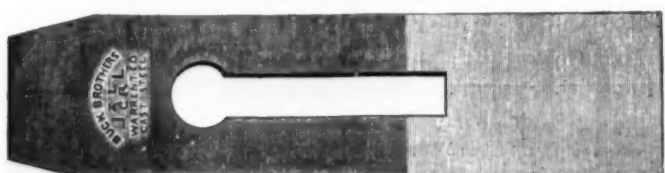
No. 4298, Burglar Proof Sash Lock, Patented.

DOOR LOCKS, LATCHES, BUTTS, BRONZE TRIMMINGS, and ARCHITECTURAL BRONZE WORK GENERALLY.

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Lump and Ground.  
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The most complete assortment in the U. S. of Shank, Socket Firmer, and Socket Framing Chisels.

**PLANE IRONS.**

Gonges of all lengths, and circles beveled inside or outside. Nail Sets, Scratch and Belt Awns, Chisel Handles of all kinds. Orders filled promptly; generally same day as received.

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FUNNEL.

**Our New Patterns for 1876.**  
MADE FROM  
**BEST REFINED SMOOTH FINISH SHEET IRON.**

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Illustrated Price Lists supplied upon application. Sole Manufacturers  
**SIDNEY SHEPARD & CO., Buffalo, N. Y.**

**STAFFORD MANUFACTURING CO.'S**  
Stencil Combinations.



Containing: Stencil Alphabet, Figures, Can Stencil Ink and Brush.  
For marking boxes, barrels, bags, and packages for shipment. Printing all manner of showcards, notices, signs, numbers, prices, &c., and other purposes too numerous to mention. Instructive and amusing for boys.

### WHOLESALE PRICES.

Size.	per dozen.	Size.	per dozen.
1/2 in.	\$6.00	1 1/2 in.	\$10.00
3/4 in.	6.50	2 in.	12.00
1 in.	7.00	2 1/2 in.	18.00
1 1/4 in.	9.00	3 in.	with lower case, 15.00

An Illustration of sizes sent on application.  
For sale by Hardware Dealers and Stationers.  
**No. 66 Fulton Street, New York.**

**CHAMPION HOG RINGER**  
Rings and Holder  
Only Double Ring  
ever invented.  
The only ring that  
will keep HOGS  
from rooting. No  
sharp points in the  
nose.

**EAGLE BILL CORN HUSKER**  
Is the best Husker in the  
market. Farmers say it  
is the best. Use no other.  
Ringers 75c. Rings 50c. 100. Holders 75c. Huskers 25c.

**BROWN'S HOG AND PIG RINGER and Rings.**  
Only Single Ring  
that closes on the  
outside of the nose.  
No sharp points in  
the nose to keep it  
sore.  
**CHAMBERS & QUINLAN,**  
Exclusive Manufacturers, Decatur, Ill.

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TRADE MARK  
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**OSBORN BRIGHT METAL CAGES.**

Also OSBORN & DRAYTON improvements under  
twelve different patents. We are continually bringing  
out new and beautiful designs to meet the demands of  
refinement and taste.

**ALVAN DRAYTON, General Agent.**

**JOHN MAXHEIMER,**  
Manufacturer of  
Japanned & Patent Eureka Bright Metal  
**BIRD CAGES,**

247 and 249  
Pearl Street,  
NEW YORK.

FULL SIZE 07  
WIRE CONNECTION

Patented June 8, 1862;  
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## SHOVELS & GRAIN SCOOPS

That will not Break.

They are made with

**CORRUGATED STRAPS,**

(From A to B on both back and  
front sides) making the weakest the  
strongest point of the Shovel. Ask  
for Scoops with

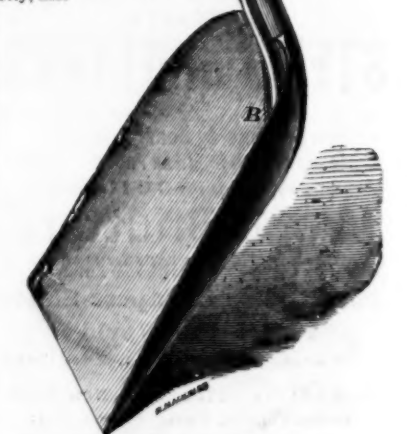
**"PATENT CORRUGATED  
STRAPS."**

They are now manufac-  
tured by the following:

OLIVER AMES & SONS,  
North Easton, Mass.; H. M.  
MYERS & CO., Beaver Falls,  
Pa.; MAX ROLAND & CO.,  
Philadelphia; GROOM SHOVEL  
CO., St. Louis, Mo.

They are sold by the fol-  
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JOHN PRITZLAFF, Milwau-  
kee; A. F. SHAPLEIGH & CO.,  
and SEMPLE, BINGE & CO.,  
St. Louis; W. M. WYETH &  
CO., St. Joseph, Mo.; DUN-  
CAN, WYETH & CO., Kansas  
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Manufacturers of Railroad Car, Locomotive, Omni-  
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**W. R. OSTRANDER,**  
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**ALARM SPEAKING TUBE WHISTLE,**  
Speaking Tube, Elbow and Mouthpieces.  
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**SPEAKING TUBES FITTED UP.**

19 Ann Street. NEW YORK.



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MANUFACTURERS OF

Pen and Pocket Cutlery, Solid Steel Scissors, Shears, Razors,  
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Sole Proprietors of the renowned full concave patent

**"ELECTRIC RAZORS,"**And the **"ELECTRIC SHEARS,"** Nickel Plated  
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**PATENT FINE PEN & POCKET CUTLERY**  
WEST MERIDEN, CONN.

The only Knives made that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the Best American Knife. We also make

**NICKEL & SILVER PLATED POCKET KNIVES**

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory, and in New York by Messrs. J. Clark Wilson &amp; Co., No. 81 Beekman Street (who have a full stock of all patterns always on hand), and also by Messrs. G. B. Walbridge &amp; Co., No. 99 Chambers Street.

## NAUGATUCK CUTLERY CO.,

Manufacturers of FINE PEN &amp; POCKET CUTLERY.

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**SHEARS & SCISSORS.**Made by a new process **RECENTLY PATENTED** which enables me to produce goods that in quality, finish and general excellence surpass any. All warranted Solid Cast Steel Blades.Oride Handles  
Crocus Finish.

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Electro Plated Ware, German Silver and Britannia Spoons.



THE "PALACE."

Factories, Wallingford, Conn.

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**SUPPLIES, in every variety,**

For Railroads, Mills and Manufacturers.

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Hardware Commission Merchants,  
EXPORTERS AND IMPORTERS,  
BIRMINGHAM, - ENGLAND.

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VAN WART &amp; MCCOY,

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At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

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Young's Patent Folding Scissors.



Fits simile of the small size.

These Scissors are made of the very best steel, nickel plated, and so constructed that they can be readily folded and carried in the pocket without injury to the garments. A sample pair will be sent by mail, to the trade only, upon receipt of the retail price, namely: For small size, either blunt or pointed, \$1.00; Large size, pointed or half pointed, \$1.50. New York, Feb. 1st, 1876.

MARX BROS., Proprietors,  
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PEN AND POCKET KNIVES,**

MANUFACTURED BY

PEPPERELL,

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My Blades are forged from the best Cast Steel, and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society, also a Gold and Diploma from the Mass. Mechanics Ass'n Sept., 1869.

## Cutlery.

ESTABLISHED 1852.

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**Table & Pocket Cutlery,**WARRANTED TO BE MADE OF THE BEST  
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76 Reade Street, N. Y.

## New Publications.

THE CITY OF HOLYOKE—ITS WATER POWER AND ITS INDUSTRIES: Published, we believe, by the Holyoke Water-power Company; 15 pages, 17x22 inches. Illustrated.

This pamphlet, as we suppose it must be called, more nearly resembles a newspaper in form and size. The heading is very artistic, and contains a very picturesque view of the city of Holyoke. On the first page is a fine picture of the dam of the Holyoke Water-power Company, in which the effect of light on the surface of the river, and the rush of water across and down the apron are admirably rendered. The first two pages are devoted to a history of the town, water-power and dam, cost of power to consumers, railroad facilities, and various other matters of interest connected with the town. The remaining space is devoted to a two page map of the city, and 61 engravings of works, factories, public buildings and points of interest in and about the city. This is the finest work of the kind that we have seen, the engravings being uniformly excellent, meriting praise both for their artistic beauty and for good engraving. The printing is all that could be desired, and the tinted paper is admirably suited to the work. The product of the various mills, their capacity and their sizes, accompany the illustrations and add to their value. As a publication it reflects credit upon all who have been concerned in getting it up. In looking over the inducements which are presented to manufacturers to settle in Holyoke, we are struck first with the enormous amount of power available, amounting to 30,000 horse-power. This power is sold to mill owners by the 65 horse-power, for which an annual rental is exacted, which, at the present price of silver, amounts to 4-62 cents per horse-power per annum—an amount so small as to be hardly worth consideration. This, coupled with the easy access to all parts of the country by rail, and the abundant supply of lumber from the upper part of the Connecticut, make Holyoke a most desirable location for a manufacturing business.

## Centennial Notes.

THOS. MILLS & BROTHER, Philadelphia. A number of very interesting and useful appliances, used in the manufacture of confectionery goods, are displayed by this firm in Machinery Hall. They are not only of special interest to the trade, but by their peculiar and ingenious adaptation to the purposes for which they are used, may be profitably studied by all classes of visitors. A brief description of a portion of these exhibits may not be out of place in these columns, and we will first refer to Mills' patent ice cream freezer. The machine is made in the most substantial manner, the frame being entirely of iron and built upon an iron base, so that there is nothing to warp or twist out of line. The freezing apparatus, consisting of one tub, one copper can and lid, and one dasher or beater, can be removed with the greatest ease from the machine and replaced in less than half a minute. The copper cans are well lined inside, and the tubs are made of the best seasoned cedar, with heavy improved handles. It can be operated either by hand, horse or steam-power, and will freeze 40 quarts in 30 minutes, 25 quarts in 20 minutes, 18 quarts in 15 minutes, 12 quarts in 10 minutes; and it is claimed will freeze smoother, with less ice and salt, and less labor than any other machine now in use. Where the boiler and engine are used the power is applied direct, no belts being required, consequently no parts to become disengaged from the machine and mislaid or lost, while the boiler is complete in all its parts—all ready to be put in position at once. The makers claim that in using this freezer there is a large saving in ice and salt, and that when it is properly operated the quantity of cream produced is much greater than by other machines. The dasher or beater attached to it is so constructed that it removes the frozen cream from the inner surface of the can as rapidly as formed, while the deflection in the center of the beater directs the unfrozen cream to the side of the can, so that the whole body of cream is constantly changing position, insuring a rapid conversion into the desired frozen mass. They also display an improved steam boiling apparatus, for boiling cream, heating water, canning fruits, and various other things connected with the business. It consists of two copper kettles, one inside the other, bolted firmly together, leaving a space between them for the steam. The inside kettle is lined with tin, and is of sufficient capacity to boil 60 quarts of cream in 10 minutes, simply by turning the steam on from the boiler. It is provided with two globe valves, one safety valve and one discharge cock. It would take too much space to permit a detailed account of their exhibits; we may briefly mention, however, the fruit drop machine, which will turn out all kinds of designs of patterns in candies, varying from 40 to the pound to 1000 to the pound. Another very useful machine is the coconut grater, which is guaranteed to grate perfectly every particle of coconut placed in the hopper. No. 1 will grate 60 to 100 nuts per hour, while No. 2 will grate 200 per hour. The almond peeler is another interesting article, and is warranted to peel 40 pounds of almonds per hour. We might mention other machines of great utility, and at the same time so peculiar in construction and simple in operation that they are well worth examining by every visitor, but to the trade they are of special interest, and we take pleasure in commending the display to their attention.

**All Clamp SKATES.**

WINSLOW'S

Improved All Clamp Club, New York Club, Ladies' Skates, Standard Styles of Wood Top Skates. New Pattern Japanned Steel Top Skates with Heel Plates, the Best low priced Skate in the market. A full line of

Winslow's Popular Skates.

**BRADFORD & ANTHONY,**  
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Sole Selling Agents. Also Sole Agents in the United States for Patent ACME Club Skates. Send for general Skate Catalogue.

**Flower Pot Brackets,**  
AQUARIASelf-Acting Fountains,  
FLOWER STANDS, Etc., Etc.

Files, Vises, Metallic Planes, Etc., Etc.

**G. WEBSTER PECK,**

Manufacturers' Agent,

110 Chambers Street, N. Y.

Send for Price Lists.

**IRON ORE SAND**For lifting heavy weights, etc. By cargo, \$10 per ton. E. B. ESTES,  
276 Pearl Street, N. Y.

Company had been protested at the banks, and that the institution is undergoing serious embarrassment. The report of the paper being protested is verified, and the Wisconsin further learns that the company is busy preparing a statement of its financial condition. As its assets are large, and the business in a fair condition, it is probable that after the company has made its exhibit relief will be forthcoming. The works of the company are still running as usual, and it would be a calamity to have them suspend which the people of the whole State will hope to see prevented.

The embarrassed condition of the company has long been known to a few of our citizens beside the directors and stockholders, but the prospects of improving business has kept any expression regarding it from being made public until yesterday, when the Wisconsin published the startling news that the paper of the institution had gone to protest, and that the company was obliged to present its creditors with a statement of its exact financial condition.

The stock of the Milwaukee Iron Company up to two years ago was considered to be among the best in the Western market. The depression of the times, however, brought disaster to the mills, and in the shrinkage of values of one kind and another, and in the effort to keep up a bold front, a great deal of money has been lost—not less, it is announced to-day, than a million and a half of dollars.

The assets of the company are estimated to be nominally about two and a half millions, upon which there is a mortgage of one million, with eight per cent. interest, payable quarterly in advance.

These rumors are not flying in the air, but come from sensible business men, and their truth is not to be greatly doubted. The management of the Milwaukee Iron Company is eminently capable, and whatever disaster may have befallen it is certainly unavoidable, and solely due to the terrible decline in iron values.

It is further stated that a settlement will be effected with the creditors at once, after which there will be a reorganization of the company. The terrible calamity of the suspension of the mills is likely to be prevented judging from present appearances. At this time the works are in progress as usual.

## Hotchkiss Revolving Gun.

The following is an account by a Sun correspondent of a trial of the new Hotchkiss revolving gun at Sandy Hook, together with some notes on a new breech-loading rifle which was tested about the same time. The shell used in the gun is also a new invention of Mr. Hotchkiss:

Preliminary trials of three remarkable military inventions were concluded on Saturday of last week, having been in progress at Sandy Hook since Thursday last. All are the devices of Mr. B. B. Hotchkiss, a well known inventor of rifle projectiles used during the rebellion. The most important of the trio is a revolving cannon, consisting of five steel barrels of 1.5 inch caliber, grouped about a horizontal shaft. The gunner, by turning a crank extending from the stationary breech, causes the shaft and barrels to revolve, and, while this rotation is in progress, mechanism is operated which shoves fixed ammunition into the rear of each barrel, and then, as the loaded barrels continue their revolution, a spring plunger strikes each cartridge in succession, and each barrel is thus discharged in turn. The projectiles are percussion conical shells, weighing about one pound each, and the rapidity of fire has exceeded 100 shots per minute. As each shell on striking bursts into an average of 17 effective pieces, the above volley is equal to 1700 bullets striking within an area of 360 square feet in the above period of time. The range far exceeds that of any small arm. The revolving cannon, according to the records of previous trials made in France, throws with accuracy over a distance of nearly four miles.

The Sandy Hook trials were conducted in the presence of Colonels Crispin, Bayler and Treadwell and Major McKee, of the United States Army Ordnance Board, and are but the precursors of more extended tests in the future. The principal results were those obtained from firing at four targets 25 by 10 feet in size, the nearest of which was at 3000 yards from the piece, and the others beyond at intervals of 125 feet apart—all being in line. Seventy shots were fired, and despite the high wind crossing the range, 200 hits were noted, the shells bursting between the first and second targets.

The cause of the remarkable accuracy of the gun and its great range is found in the peculiar construction of the projectiles, which consists simply in rounding off the edge of the butt of the shell, so as to avoid the sharp corner in the rear. This modification has been found to augment the range 20 per cent., and greatly to increase the accuracy. The subject has excited interest among army circles.

While the revolving cannon tests were in progress the army officials were experimenting upon a new magazine rifle. This weapon had never before been tested, and the trials proved that it is capable of being fired at the rate of six shots in six seconds. It is about the size of the ordinary regulation rifle, but discharges the heaviest French cartridges. The curious feature about it, is that while it is a magazine rifle, that is, will fire as many shots in succession as there can be cartridges accommodated in the breech receptacle, after the principle of the famous Winchester rifle, it is entirely destitute of any magazine mechanism. A simple spiral spring pushes the cartridges forward through a ring in the stock, to which ring the trigger is attached. When the trigger is at rest this ring is out of line with the cartridge tube, of which it forms a section, and hence no cartridges are pushed forward. When the trigger is pulled back the ring is brought into line long enough to let a cartridge pass and take the place of the one which the ordinary lock mechanism at the same instant discharges. The opening of a sliding piece on the breech as the gun is brought down from the shoulder then throws out the old shell and enables the new cartridge to enter the barrel.

The tests on all these inventions are shortly to be resumed on an elaborate scale under army auspices. The revolving cannon has already been adopted by the Argentine, Chinese and Brazilian governments.

## Milwaukee Iron Company.

The Milwaukee Evening Wisconsin has the following regarding the affairs of the Milwaukee Iron Company: "Last evening a report was circulated that notes on the Milwaukee Iron



HARVEY W. PEACE.

JOHN HOGAN.

**PEACE & HOGAN,**VULCAN  SAW WORKS.

MANUFACTURERS OF EVERY KIND OF

**Patent Ground Saws,**CIRCULARS, CROSS-CUTS, MILL, MULAY, GANG, HAND, & BUTCHER.  
Molding and Planing Knives, Plastering Trowels, Mitering Rods, &c.

FACTORIES:

Union Avenue, Tenth & Ainslie Sts., BROOKLYN, E. D., N. Y.  
OFFICE & WAREHOUSE, 59 Beekman Street, New York.E. C. ATKINS. ESTABLISHED 1857. H. KNIPPENBERG.  
**E. C. ATKINS & CO., Indianapolis, Ind.,**  
Saw Manufacturers and Repairers.

GENUINE SILVER STEEL DIAMOND X CUT SAW.

\$1.50 Per Foot.



BEWARE OF THE IMITATION CALLED "DIAMOND TOOTH."

**Wheeler, Madden & Clemson**

MFG. CO.,

MIDDLETOWN, - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

**SAWS**

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand,  
**WOOD SAWS. Etc., Etc.****AMERICAN SAW CO.,**

Manufacturers of

Movable Toothed Circular Saws,  
**PERFORATED CROSS-CUT SAWS**  
And SOLID SAWS of all kinds. Trenton, N. J.**J. CLARK WILSON & CO.,**

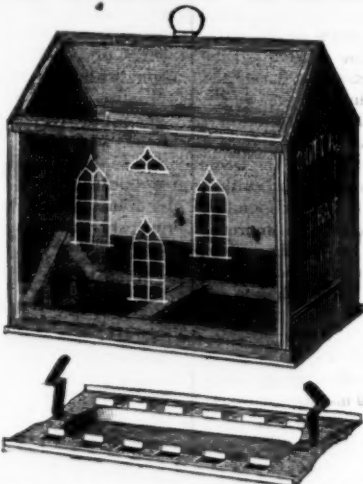
Manufacturers and Jobbers of Hardware,

51 Beekman Street, New York. P. O. Box 2355.

AGENTS FOR

**THE COTTAGE FLY TRAP.**

It has Won the Praise of Thousands.



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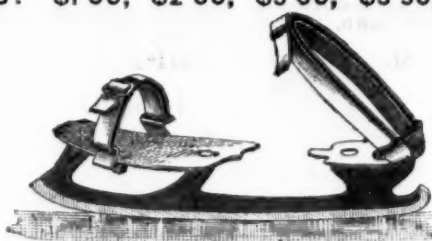
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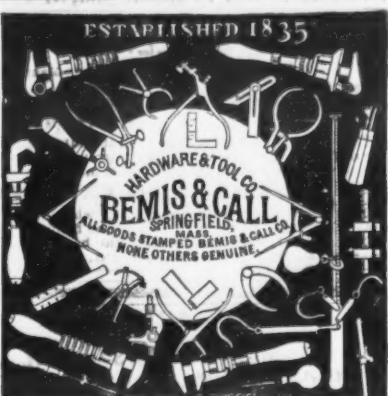
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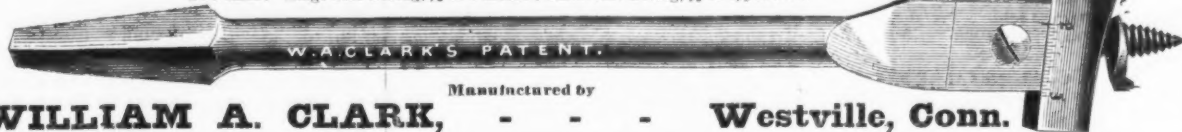
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 Ponsard & Gigle, Italy, Ferro-Manganese.  
 Aktie Bolog Bofors Gullspan, Sweden, Ores, Pig Iron, Wire and Nail Rods.  
 Fagersta Bruk, Sweden, Iron Ores, Pig Iron, Bessemer Ingots, and articles of Bessemer Steel.  
 Jernkotsset, Sweden, Geological Maps, Plans of Iron Mines, Iron Ores, Iron and Steel products therefrom, Drawings of Furnaces.  
 Motala Mekanska Verkstad Actie, Sweden, Bolag, Iron Ores, Pig Iron, and products in Bessemer and Siemens-Martin Metal, as well as in Puddled and Iron and Steel.  
 Imperial Works of Kama, Russia, Rolled Iron.  
 Salvator Sabate Brunet, Spain, Barcelona, Mining Tools.

## Group II.

Dover Fire Brick Co., Canal Dover, O., Fire Brick.  
 B. Kreischer & Son, New York, Clay Retorts, Muffle or Assay Furnaces.  
 Robert Taylor & Co., Philadelphia, Black Lead Crucibles, and large Stills for Zinc.  
 Union Mining Co., Mt. Savage, Md., Fire Brick for Blast Furnaces, and Siemens-Martin's Furnaces.  
 Phoenix Mfg. Co., Taunton, Mass., Black Lead Crucibles for Smelting Steel, Bronze, etc., and Stills for Zinc.  
 Geo. C. Hicks & Co., Baltimore, Clay Retorts, Gas Works Tiles and Fire Brick.  
 Philp Newkumet, Philadelphia, Clay Retorts and Fire Brick.  
 Kier Bros., Salina, Pa., Fire Brick, Furnace Brick, Arches and Keys.  
 A. J. Haws, Johnstown, Pa., Fire Bottom for Bessemer Steel Converter, Fire Clay Tuyeres, Patent Nozzles and Stitches for Ladle Rods and Furnace Brick.  
 Newton & Co., Albany, Fire Brick Linings for Stoves, etc.  
 Louisville Plate Glass Co., Louisville, Ky., Large Glass Plate.  
 Wm. L. Grege, Philadelphia, Brick Machine, and Ceramic Gas Kiln.  
 Excelsior Brick and Stone Co., Philadelphia, Excelsior Brick Machine.  
 Augustus Morand, Philadelphia, Plastic Brick Machine and Kiln.  
 S. Williams & Son, Philadelphia, Brick Presses.  
 F. L. & D. R. Cornell, Philadelphia, Brick Presses, of various sizes.  
 S. P. Miller & Sons, Philadelphia, Hand Presses for Bricks.  
 I. P. Alexander, Akron, O., Fire Bricks.  
 Isaac Gregg, Jr., & Co., Philadelphia, Brick Machine.  
 A. Hall & Sons, Perth Amboy, N. J., Fire Bricks.  
 Davis & Chaddock, Boston, Fire Brick.

## Group IV.

Rankin Mfg. Co., Pittsburg, Meat Choppers.  
 Boomer & Boschert, Syracuse, N. Y., Presses.  
 August Mittinger, Jr., Philadelphia, Butchers' Tools, Meat Choppers, etc.  
 Bailey Wringing Machine Co., New York, Meat and Vegetable Choppers.  
 Murray Iron Works, Burlington, Iowa, Meat Cutters.

## Group V.

A. B. Shipley & Sons, Philadelphia, Rods, Reels, etc.  
 Bradford & Anthony, Boston, Anglers' Implements, Hooks, etc.  
 White Mfg. Co., Bridgeport, Fishing Lamps.  
 John Russell Cutlery Co., Turner's Falls, Mass., Fishing Knives.  
 S. Elwell, Jr., Gloucester, Mass., Fishing Knives.

## Group VI.

C. B. Evans & Co., Cincinnati, Cast Iron Marbleized Mantels.  
 Clark & Co., New York, Steel Shutters.

## Group VII.

Lash & Co., Philadelphia, Washing Machine.  
 Bradford & Co., Philadelphia, Wash Fastener.  
 W. M. Smith, West Meriden, Conn., Casket Trimmings.  
 National Wire Mattress Co., New Britain, Conn., Wire Mattress.  
 Calkins Champion Washer, Chicago, Washing Machines.  
 Colby Winger Co., Waterbury, Vt., Clothes Winger.  
 T. K. Dugdale, White Water, Ind., Clothes Winger.  
 A. B. Barnard, West Fitchburg, Mass., Clothes Mangles.  
 J. W. Pratt, Philadelphia, Washing Machines.  
 T. E. Grove, Cleveland, Washing Machine.  
 York Mfg. Co., York, Pa., Washing Machine.  
 Oakley & Keating, New York, Washing Machine.  
 Isaiah D. Buck, Bridesburg, Pa., Washing Machine.  
 Lloyd Bros., Philadelphia, Ventilating Window Shade Fixture.  
 Asa E. Worden, Smyrna, Del., Washing Machine.  
 H. A. Briggs, Shaker Village, N. H., Washing Machine.  
 Cheney, Hopkinton, Mass., Washing Machine.  
 A. W. Jennings, Bedford, O., Washing Machine.  
 The Hartford Woven Wire Mattress Co., Hartford, Conn., Woven Wire Mattresses, etc.  
 William Campbell, New York, Spring Rollers for Window Shades.  
 Salem Shade Roller Mfg. Co., Salem, Mass., Balance Spring Shade Roller, etc.  
 Maires & Reed, New York, Adjustable Iron Chair Frame.  
 Reed & Barton, Taunton, Mass., Casket Trimmings.  
 Lowerre & Tucker, Newark, N. J., Fluting Machine.  
 C. Rogers & Co., West Meriden, Conn., Casket Trimmings.  
 Newton, Wilson & Co., England, London, Washing Machine.

## Group VIII.

Sellers Mfg. Co., Philadelphia, Wire Cloth for Paper Machines.  
 Clinton Wire Cloth Co., Clinton, Mass., Wire Fire-proof Lathing, Fencing Screens.  
 Asbestos Patent Fiber Co., Philadelphia, Asbestos, Fiber and Fabric.

H. W. Johns, New York, Asbestos Fiber and Fabric.  
 Woven Wire Mattress Co., Hartford, Conn., Wire Mattresses.  
 G. Dewitt, Bros. & Co., Belleville, N. J., Fine Wire Cloth.  
 Pennsylvania Wire Works, Philadelphia, Wire Goods.  
 J. B. Brown & Co., Great Britain, London, Galvanized Wire Netting.  
 N. Greening & Sons, Great Britain, Warrington, Woven Wire.  
 Ph. J. Schoeller & Sons, Bavaria, Neustadt, Wire Cloth, double twilled.  
 J. Anderson, Sweden, Kjardingagard, Grioso, Wire and Sieve Cloth.  
 Louis Herrmann, Jr., Bavaria, Dresden, Wire Goods.  
 Barnard, Bishop & Barnards, Great Britain, Norwich, Wire Fencing.

## Group X.

Pope Mfg. Co., Boston, Ride Air Pistol.  
 National Rubber Co., Providence, R. I., Belting.  
 New York Belting and Packing Co., New York, Rubber Goods.

## Group XI.

Derby Silver Co., Derby, Conn., Plated Table Ware.  
 Holmes, Booth & Hayden, Waterbury, Conn., Silver-Plated Goods.  
 Mitchell, Vance & Co., New York, Bronze, Marble, Zinc, and Imitation of Bronze.  
 Gorham Mfg. Co., Providence, R. I., Silver Ware.  
 Ames Mfg. Co., Chicopee, Mass., Bronze.  
 P. L. Kridler, Philadelphia, Solid Silver Table and Hollow Ware.  
 Gorham Mfg. Co., Providence, R. I., The Century Vase in Solid Silver.  
 Tiffany & Co., New York, Silver Work.  
 Reed & Barton, Taunton, Mass., Silver-Plated Goods and Nickel-Plated Vase.  
 Adams, Shaw & Co., Providence, R. I., Silver Plate.  
 Manning, Bowman & Co., West Meriden, Conn., Nickel-Plated Ware.

## Group XIII.

Jos. Dixon Crucible Co., Jersey City, Lead Pencils.  
 Hart, Bliven & Mead Mfg. Co., New York, Stationary Hardware.  
 French Paper Ware Co., Springfield, N. J., Paper Ware.  
 A. W. Faber, Germany, Stein near Nuremberg, Lead Pencils, Artists' Pencils, Colored Pencils, etc.

## Group XIV.

W. H. Jackson & Co., New York, Grates and Fenders for Open Fires and Fire Places.  
 Dover Stamping Co., Boston, Dover Egg Beater.  
 Austin, Opdyke & Co., Philadelphia, Galvanized Corrugated Rain Spout.  
 Pennsylvania Galvanizing Works, Philadelphia, Galvanized Goods of all Descriptions.  
 Duncan Cameron, New York, Steam Fruit Preservers.  
 Redlichs Mfg. Co., Wooden Faucets saturated with India Rubber.  
 United States Soapstone Furnace Co., Boston, Soapstone Furnace.  
 Wakefield Earth Closet Co., New York, Earth Closets, Cabinet Closets.  
 The Kellum Mfg. Co., Harrisburg, Pa., Standard Quart Measure.  
 Geo. I. Mix & Co., Yaleville, Conn., Iron and Britannia Spoons, Silver-Plated Water Coolers, etc.  
 Jos. H. Corey, New York, Improved Culinary Boiler, etc.  
 Detroit Stove Works, Detroit, Stoves for Parlors, Halls, Stores, etc.  
 Henry Chatain, Washington, D. C., Oven for Baking, Confectioners, Hotels, etc.  
 Sidney Shepard & Co., Buffalo, Ice Cream Freezers, Patented Palace Coal Vases, Novelty Oil Cans.  
 Isidor Brach, Philadelphia, Reversible Water Filter, etc.  
 Tuttle & Bailey, New York, Vertical Wheel Registers for Heating and Ventilation.  
 Newark Tea Tray Co., Newark, N. J., Tray and Waiters (Japanned).  
 Musgrove & Son, New York, Planished and Japanned Silver Ware.  
 Charles Noble & Co., Philadelphia, Stoves, Ranges, etc.  
 Ella Haller, New York, Reservoir Fruit Jar.  
 Enterprise Mfg. Co., of Pennsylvania, Philadelphia, Double Pointed Smoothing Irons, Sausage Stuffer and Coffee Mill.  
 J. Eldridge Smith, Philadelphia, Double Griddle.  
 Jacob H. Polhamus, New York, Refrigerating Cupboard and Safe.  
 Smith Refrigerator Co., Albany, Dry Air Refrigerator.  
 Charles G. Blatchley, Philadelphia, Horizontal Ice Cream Freezer.  
 Stuart, Peterson & Co., Philadelphia, Tinned and Enamelled Cast Iron Hollow Ware.  
 W. S. Carr & Co., New York, Bath Room Furniture.  
 Henry C. Meyer, New York, Murdoch Patent Anti-Freezing Hydrant.  
 St. Louis Stamping Co., St. Louis, Kitchen Ware.  
 E. Pratt, Philadelphia, Soapstone Goods, including Stoves, Sinks, etc.  
 Manning, Bowman & Co., West Meriden, Conn., Tea and Coffee Pots and Urns.  
 Holmes, Booth & Hayden, Waterbury, Conn., Kerosene Oil Burners, Lamps, etc.  
 Moorehead Clay Works, Philadelphia, Drain and Sewer Pipe.  
 Keen & Hagerty, Baltimore, Hagerty's Patent Street Lamp.  
 White Mfg. Co., Bridgeport, Conn., Carriage Lamps, Dash Lamps, etc.  
 Excelsior Lantern Co., or Miller & Eastmead, New York, Lanterns.

## Group XV.

Hart, Bliven & Mead Mfg. Co., New York, Building and Household Hardware and Furniture Trimmings.  
 Lloyd, Supple & Walton, Philadelphia, Screw and Spring Padlocks, Hollow Augers, etc.  
 The Brantford Lock Works, Brantford, Conn., Rim and Mortise Locks, Latches, Door Knobs, etc.  
 The Langdon Miter Box Co., Miller's Falls, Mass., Miter Boxes with Fixed Saws.  
 The Davis Level and Tool Co., Springfield, Mass., Levels, Plumbs, etc.  
 Snell Mfg. Co., Fiskdale, Mass., Augers, Auger-bits, Boring Machines.  
 Dewitt, Morrison & Kelly, Philadelphia, Augers, Auger-bits, Flour Tryers, etc.  
 D. K. Miller & Co., Philadelphia, Self-Locking Padlocks.  
 Sandusky Tool Co., Sandusky, O., Carpenters', Joiners' and Wood Turners' Tools, etc.  
 Blake Bros. Hardware Co., New Haven, Conn., Butte, Door Handles, Pulleys, Castors, etc.  
 Eagle Square Mfg. Co., South Shaftsbury, Vt., Steel Framing Squares.  
 John Russell Cutlery Co., Turner's Falls, Mass., Table Cutlery, Butcher, Hunting and Painters' Knives.  
 D. R. Barton Tool Co., Rochester, N. Y., Chisels, Draw Knives, Axes, Hatchets, etc.

Hotchkiss' Sons, Bridgeport, Conn., Curry Combs, Animal Traps, Breast Drills, Saw Sets, etc.  
 Gaylord Mfg. Co., Chicopee, Mass., Cabinet, Tilt and Chest Locks.  
 Mallory, Wheeler & Co., New Haven, Conn., Rim and Mortise Locks, Latches, Padlocks, etc.  
 Union Mfg. Co., New Britain, Conn., Butt Hinges.  
 Job T. Pugh, Philadelphia, Augers, Bits, Flour Tryers, etc.  
 Harrison & Kellogg, Troy, N. Y., Castings of Malleable Iron and Cast Steel, Wrenches.  
 Stanley Rule and Level Co., New Britain, Conn., Rules, Plumbs, Levels, Planes, Plane Irons, etc.  
 George Selsor & Co., Philadelphia, Hammers, Hatchets, Hand Saws, Coffee Mills, etc.  
 Stanley Works, New Britain, Conn., Cast Butts, Hoop and T-Hinges and Wrought Hinges, etc.  
 Leonard, Bailey & Co., Hartford, Iron Planes, Try Squares and Bevels.  
 P. & F. Corbin, New Britain, Conn., Rim and Mortise Locks, Brass and Iron Hinges, etc.  
 United States Shear Co., West Meriden, Conn., Cast Steel Scissors and Shears.  
 Miller Brothers Cutlery Co., West Meriden, Conn., Pocket Knives.  
 Norwalk Lock Co., South Norwalk, Conn., Locks, Bolts, Knobs, Window and Door Fittings, etc.  
 Henry Seymour & Co., New York, Malleable Shears and Scissors (steel lined).  
 A. W. Crossman & Son, West Warren, Mass., Chisels and Draw Knives, etc.  
 Douglass Axe Mfg. Co., East Douglass, Mass., Axes, Hatchets, Picks, Adzes, etc.  
 Yerkes & Plumb, Philadelphia, Hand Axes, Hatchets, Cleavers and Hammers.  
 Klein, Logan & Co., Pittsburgh, Picks, Mattocks, Stone Hammers and Sledge.  
 R. Maydole & Co., Norwich, N. Y., Hammers.  
 Collins & Co., Hartford, Axes, Hatchets, Picks, Adzes, Wrenches, Cane Knives, etc.  
 L. Herder & Son, Philadelphia, Malleable Tailors' Scissors.  
 Lamson, Goodnow & Co., Sherborne Falls, Mass., Table Cutlery, Cooks' and Butcher Knives.  
 Trenton Lock and Hardware Co., Trenton, N. J., Rim Mortise, Pad, Tilt, Car and Safe Locks.  
 Ohio Tool Co., Columbus, O., Planes, Bench Screws, Chisels, Draw Knives, etc.  
 Carr, Crawley & Devlin, Philadelphia, Building and Cabinet Hardware, also Castings.  
 Alfred J. Colton, Philadelphia, Planes.  
 Union Steel Screw Co., Cleveland, Wood Screws made from Brass and Steel.  
 William Johnson, Newark, N. J., Carpenters' and Mechanics' Tools, and other Hardware.  
 Josiah King & Son, New York, Planes (of all varieties).  
 William Rose, Bro. & Co., Philadelphia, Brick, Plastering and Molders' Trowels.  
 Bailey Tool Co., New York, Iron Planes and Spoke Shaves, etc.  
 Wheeling Hinge Co., Wheeling, W. Va., Wrought Butts, Strap and T Hinges, Hasps, etc.  
 Scoville Mfg. Co., Waterbury, Conn., Brass Butts and Hinges, Piano Hinges, Castors, etc.  
 Howard W. Shipley, Philadelphia, Pocket Knives.  
 Middletown Tool Co., Middletown, Conn., Plane Irons.  
 Bevin Bros. Mfg. Co., East Hampton, Conn., Sleigh and Hand Bells, Gongs, etc.  
 W. E. Barton, East Hampton, Conn., Sleigh and Hand Bells, Gongs, etc.  
 G. W. Nock (Penn Lock Works), Philadelphia, Padlocks and Car Padlocks.  
 W. T. & L. Moser, New York, Stair Rods, Dog Collars and Muzzles.  
 American Stair Rod Co., New York, Stair Rods, Fastening Nails, etc.  
 J. L. Mott Iron Works, New York, Fountains, Vases and Statuary.  
 A. Field & Sons, Taunton, Mass., Tacks and Nails (Iron and Copper).  
 American Wire and Screw Nail Co., Covington, Ky., Wire and Screw Nails.  
 J. F. Armbruster, Philadelphia, Casting made from Tin Waste.  
 Gong Bell Mfg. Co., East Hampton, Conn., Hand Call, Sleigh and Gong Bells.  
 W. A. Ives & Co., New Haven, Conn., Braces, Auger Handles, Tap Borers, Augers, etc.  
 A. G. Newman, New York, Buckman's Patent Spring Bolts, Automatic Window Locks, etc.  
 M. Gould's Sons, Newark, N. J., Stair Rods, Dog Collars, etc.  
 H. S. Shepardson & Co., Shelburne Falls, Mass., Gimlet Bits, Reamers, Gardeners' Sets, Gouges, etc.  
 W. J. Tiebout, New York, Ship Hardware (Brass and Iron).  
 American Screw Co., Providence, R. I., Iron, Brass and Steel Screws, Carriage and Stove Bolts, etc.  
 The Meriden Cutlery Co., Meriden, Conn., Table Cutlery.  
 R. Heinisch Sons, Newark, N. J., Tailor Shears and Scissors.  
 M. C. Mayo, Boston, Boss Planes and Adjustable Plows.  
 Benjamin F. Badger & Son, Charlestown, Mass., Razor Straps.  
 John J. Tower & Co., New York, Prison Locks, Padlocks, Wrenches, Planes, etc.  
 J. B. Shannon, Philadelphia, Door and Window Trimmings, Gongs, etc.  
 Friedman & Lauterjung, New York, Razors (concave ground).  
 Globe Nail Co., Boston, Horseshoe Nails.  
 Buck Bros., Milbury, Mass., Firmer and Socket Chisels, Plane Irons, Punches, etc.  
 John Booth & Son, Philadelphia, Braces and Bits, Spokeshafts, Turnscrows, etc.  
 P. Loucutrat, Newark, N. J., Calipers, Compass, Hammers, Punches, etc.  
 Northfield Knife Co., Northfield, Conn., Pocket Knives.  
 Elmhurst Nobles Mfg. Co., Elmira, N. Y., Axes, Draw Knives, Augers, etc.  
 A. J. Conrad, Fort Washington, Pa., Augers and Bits.  
 J. Wiss, Newark, N. J., Shears, Scissors, Shoe Knives, Pruning Shears, etc.  
 Starr Lock Works, Philadelphia, Pad and Trunk Locks, Door Springs, etc.  
 Barney & Berry, Springfield, Mass., Skates.  
 Clark's Combination Lock Co., Baltimore, U. S. Sea Padlocks and Safe Deposit Lock Co.  
 Wilson Bohannon, Brooklyn, Pad and Rim Locks.  
 Starr Tool Co., Middletown, Conn., Squares, Bevels, Calipers, Gauges, Machinists' Tools, etc.  
 Smith & Edge, Bridgeport, Government Padlocks, Mortise Locks, etc.  
 D. M. Mecker & Son, Newark, N. J., Malleable Iron and other Castings.  
 Charles Buck, Milbury, Mass., Firmer Chisels, Gauges, Plane Irons, Draw Knives, etc.  
 Romer & Co., Newark, N. J., Brass and Iron Padlocks, Rim Locks, etc.  
 Eagle Lock Co., Terryville, Conn., Tilt, Cupboard and other Locks.  
 J. E. Strauss & Co., Philadelphia, Galvanized Hods, Chains, Nails, etc.  
 Will & Finck, San Francisco, Table Cutlery, etc.  
 Darling, Brown & Sharpe, Providence, R. I., Steel Squares, Rules, etc.  
 Benedict & Burnham Mfg. Co., Waterbury, Conn., Rolled Brass and Copper, Brass and Copper Wire, Chains, etc.

[Continued on page 30.]



## Hammond Window Sash Spring.

The Hammond window sash spring is intended to lock and support both upper and lower window sashes, holding them at any desired height, and securing them when closed. But little labor or expense is required in putting them in. We publish herewith cuts showing the springs and the methods of arranging them so as to hold the window sashes.

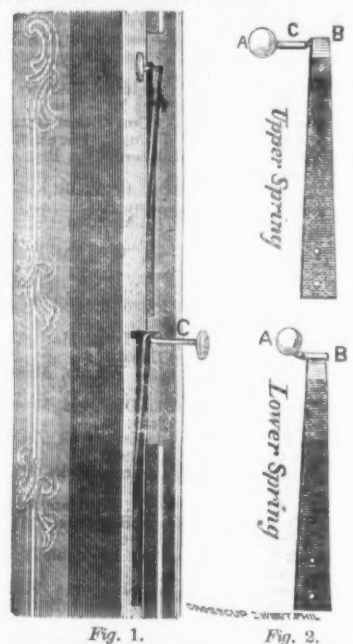


Fig. 1 is a side view of the window frame and spring. Fig. 2 shows upper and lower springs. A is the thumb piece, B the shoulder and C the neck of the spring. The thumb piece of the spring, seen in Fig. 2, is a shell neatly plated and placed upon the neck, which extends nearly across it. The whole is filled with solder, which fills the thumb piece, while making it perfectly secure upon the neck. Fig. 3 shows the upper sash dropped down almost to the lower end of the upper spring. The parting bead is removed to show the position of this spring. A part of the front bead is also removed to show the position of the shoulder

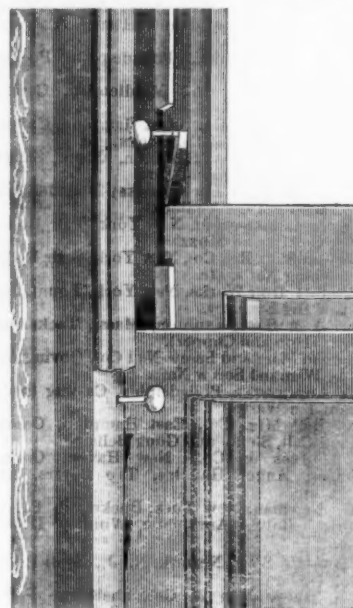


Fig. 3.

of the lower spring and sash when the latter is down and locked. It is to be observed that these springs will hold large or small windows, whether made with or without parting beads. The maker claims that these springs are made from the best materials, are warranted not to break or lose their elasticity, and if properly adjusted will work satisfactorily as long as a house lasts. They are very much cheaper than sash weights. The first notch in the sash is to raise or lower the sash about two inches for ventilating purposes in winter; other notches are placed so as to bring the sash into position so that the panes stand opposite to each other, whether sashes are both up or down.

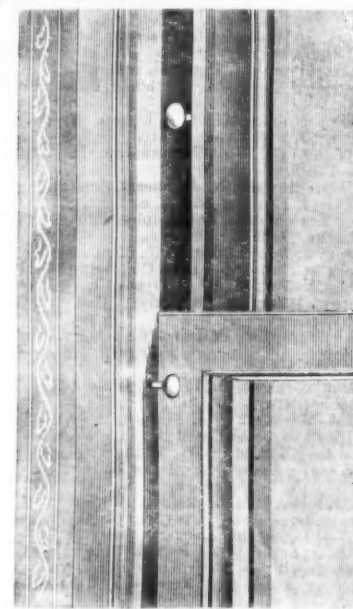


Fig. 4.

The springs occasion no inconvenience in the removal of sashes for the purpose of cleaning or painting. Fig. 4 shows both sashes closed and locked. In this position the thumb piece is

pressed back with the left hand leaving the right free to raise or lower the sash. They are made in several sizes, to adapt them to windows of all dimensions. To protect the notches from wear, a source of frequent trouble with ordinary sash springs, wrought iron points are provided, one of which is driven into each notch so as to save the wood from wear. The address of the manufacturer is W. S. Hammond, at Lewisberry, York county, Pa.

## Hardware at the Centennial.

THE COLEMAN EAGLE BOLT WORKS (Welsh & Lea), Philadelphia. This firm have two separate displays of carriage bolts, one in the Main Building adjoining the exhibits of galvanized iron, the other in the Annex to the Main Building, where most of the carriages and carriage furnishings may be found. There is no special beauty in a single carriage bolt, but this firm have succeeded admirably in making a most attractive display of their goods, by grouping them together, so as to form circles, curves, name of the firm, dates and other appropriate designs. Both displays are excellent, and deserve the attention of the trade. The bolts appear to be very smooth and uniform, and well finished. The material used is the best Swedish or Norway iron, the quality of which is shown by bends, twists, curves, &c. There are displays by other manufacturers, prominent among whom we may mention

THOS. SHIELDS, 2224 Pennsylvania avenue, Philadelphia, who has a very handsome display, the arrangement of which is exceedingly artistic and effective, and the specimens of bolts shown will bear comparison with any in the building.

WM. SHIELDS and THOS. SKELLY, Philadelphia, also have each fine exhibits of a similar character to the above, and as they all adjoin each other we have no doubt the trade will give them a critical examination.

ADVENA & HEALD, Philadelphia, display a large number of axes and axe boxes. The collar forgings range from 1/2 up to 3 inches, all forged solid, and are splendidly finished. The steel boxes are well made and adapted for both light and heavy work, combining strength with lightness, and admirably adapted to the hubs now so generally used. The excellence and uniformity of the material, as well as the splendid workmanship and fine finish, are specially noteworthy features in this exhibit. The arrangement of the exhibits is also very effective, and cannot fail to attract attention and favorable comment.

S. ROGERS & CO., Stanfordville, N. Y. This firm make a handsome display of axes, for which they claim some special excellence on account of their using only selected scrap and hammered iron, using no rolls, which they say has a tendency to make iron limber, while hammering stiffens and improves its quality, as well as making it tougher and stronger. They also display a new style of axe, known as the "ribbed" or "flanged," which, it is said, can be made lighter and stiffer than ordinary axes, and the wooden bed be so fitted to it that it makes a fine finish and does not work loose. Their composition boxes, made of copper and tin, are also a prominent feature of the exhibit, which is a very creditable one throughout.

SHEDDEN & CO., Auburn, N. Y. This firm make a particularly fine display of their specialties, the arrangement of which, taken in connection with the elaborate show cases made of various colored costly woods, produces an excellent effect. This firm manufacture the well known "anchor" brand of axes, and the display includes a full line of styles; plain and swelled, taper and half patent, mail and Collinge, common Concord and iron hub axes, together with all sizes from 5-16 to 6 inches. The workmanship is very fine, and the superior quality of the material is shown by specimens submitted to all the usual tests of bending, &c. This firm, we are informed, prepare all their own materials at their works in Auburn, and turn out about 100,000 sets of axes annually.

HAYDEN & SMITH, Auburn, N. Y., make a very handsome display of carriage hardware, and exhibit complete sets of iron for every part of a top buggy or phaeton, including the small clips and clip yokes, braces, joints, shifting rails, &c. The workmanship and material is of the very finest, and the exhibit is, in every respect, first-class, and worthy of a careful examination by the trade.

BENEZET & CO., Philadelphia. The display of carriage springs made by this firm is very attractive, and elicits favorable comments from visitors. Their specialty is in carriage springs, and their exhibit includes a full line of the various sizes and varieties. This firm have adapted the patent Caffrey attachment to coach spring work, which, it is claimed, will be an important improvement. It consists of an anti-friction brass bushing, with square bolt, which enables it to vibrate freely, with smooth motion, and it is quite noiseless. They also claim some special merits for their improvements on platform, wagon and truck springs. The plates are ribbed, which prevents the shifting which is liable to occur with the old style of slot and nib, as the nib in heavy wagons will wear off and allow the plates to shift. They also dispense with the center bolt by a neat clip, which prevents the plates from shifting end or side-ways.

WILLIAM & HARVEY ROWLAND, Philadelphia. This firm, as might be expected from their experience of 35 years and extensive connection in the trade, make a magnificent display of their specialties, including various descriptions of Swedish tire, toe, blister and spring steel. The display of elliptic, platform and C springs is especially fine, and will more than maintain their well known reputation as manufacturers of this class of goods. Every

description of spring is shown, from the one man buggy to the heaviest locomotive spring. The material used by this firm is Swedish iron exclusively, and an examination of the exhibits will show that for workmanship and finish they cannot be excelled.

**Shortest Line Across the Isthmus.**—Rear-Admiral Cochrane has written to the London Standard suggesting that it would be to the interest of England if steps were taken for surveying a route for a canal which is traced by proceeding up the Bayano River, which debouches into the Pacific about 20 miles to the eastward of Panama, to a farm or village called Jesus Maria; from thence, in a more or less direct line, to proceed to the harbor of San Blas, on the Atlantic. The map, "Selfridge's," and Admiralty Chart, demonstrates at a glance the advantages of adopting this route on account of its shortness, if it is found on survey to be otherwise suitable. The course he recommends for survey is the shortest across the Isthmus of Panama—viz., about 29 miles. He states that he ascended the Bayano River in May last, with two steam pinnaces, to Jesus Maria, in 3 1/2 hours of steaming, and carried a depth, excepting over some sand bars, of several fathoms. There he caused to be obtained observations for latitude and longitude, which showed that he had attained within 19 miles, in a direct line, of the port of San Blas, on the Atlantic, and the tidal rise of the Pacific extended several miles beyond the point attained by him.

## Special Notices.

## ASSIGNEE'S SALE

## HARDWARE, CUTLERY AND GUNS.

BISSELL, WELLES & MILLET, Auctioneers,

Will sell at Auction on Friday and Saturday, Sept. 29th and 30th, at 10 1/2 a. m., by order of ISAIAH MEYER, Esq., Assignee, the entire stock of

## Hardware, Cutlery &amp; Guns

Messrs. MEYER & KASTER, at No. 139 Duane Street, New York.

This stock is valued at over \$25,000, and comprises a large line of Table Cutlery, Eng. and Wostenholme's Pocket Cutlery, Wade & Butcher's, Rodgers' and Wostenholme's Razors, large stock of fine Scissors, Butcher and Bowie Knives.

Also Powder Flasks, Gun Material, Pistols, 500 Double Shot and Breech Loading Guns.

Also American and English Shelf Hardware, Padlocks, German Halter and Coll Chain, Hand, Panel and Back Saws, &c., &c. Also Samples, Desks, Show Cases, &c.

This sale will be worthy the attention of the trade. Catalogues ready morning of sale. Terms of sale, cash.

BISSELL, WELLES & MILLET, Auctioneers, 15 Murray Street, N. Y.

## AUSTRALIA.

AGENCIES.—B. O. HOLTERMANN, of B. O. H. & Co., Sydney, Australia, will undertake Agencies on reasonable terms for the Australian colonies. Undeniable references. Communications up to October 13 may be addressed to him at the Ashland House, 4th Avenue and 24th Street, New York; or up to October 5 to Mr. Wilmot, 855 Broad Street, Philadelphia.

The "Common Sense" Hay Cutters, "VICTOR" CORN SHELLERS, And "PRIZE" CHURN are the best.

A. B. COHU, Manufacturer, 197 Water St., one door from Fulton, New York.

"Everything for the Farm," containing illustrations of 200 of most improved implements for Farm, sent on receipt of 10c.

## Wanted, Light T Rail.

Parties having for sale 50 to 100 tons of slightly worn, 25 to 35 lbs. T Rail, can find a purchaser at a reasonable price, by addressing (with price delivered in New York or Philadelphia.)

D. G. AMBLER, Utica, N. Y.

## SPECIAL NOTICE

A new style of MEN'S SINGLE GUNS, in addition to the former line of A. Simon's, Liege, now offered.

SILSIESIAN SHEET ZINC, Imported by LOUIS WINDMULLER & ROELKER, 20 Reade Street, N. Y.

Specialties of Wrought, Cast, or Sheet Iron or Brass,

Made to order in a SUPERIOR MANNER, AT LOW PRICES, by the CORRUGATED METAL CO., East Berlin, Conn.

## WANTED, A FILE PACKER.

One who understands his business thoroughly. Address A. B., Office of The Iron Age, 10 Warren St., N. Y.

## The American Mining Board

Will hold its First Session for the Calling of Stocks, On Monday, Oct. 2, at 11 o'clock.

The list will embrace the more prominent San Francisco shares, as well as the securities of all duly approved Mining, Petroleum, Manufacturing and Quarrying Companies. Applications for membership, or for placing securities on the regular list, may be made at the temporary offices in the Drexel Building.

Candidates for membership whose nominations shall be made prior to October 1 will, when duly elected, come in as Proprietary Members. Nominations received after that date will be for Operating Membership only.

WILLIAM WARD, President.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desiring a responsible position. References satisfactory. Address, IRON AND STEEL, Care of P. O. Box 813, Bridgeport, Conn.

## Special Notices.

## TO LET,

## A Light, Handsome Office.

Possession Immediately.

HERMANN BOKER & CO., 101 Duane Street, N. Y.

## NOTICE! POND'S TOOLS.

The undersigned has assumed the Personal Property, including accounts, finished and unfinished Machinery, good will &c., connected with the manufacture of MACHINERY'S TOOLS as conducted by Mr. Lucius W. Pond since 1847, and will continue the said business at the old stand, cor. Union and Exchange Sts., Worcester, Mass., under the name of DAVID W. POND, Successor to LUCIUS W. POND.

CARD.—Having assumed the business mentioned above, I solicit inquiry and patronage, with guarantee that present standard of workmanship, and quality of Machinery shall be maintained. A large quantity of New and Second-Hand Tools, ALL STYLES AND SIZES, For Sale at Low Prices. Send for list of second-hand tools. Store at 98 Liberty St., New York, will be discontinued from Feb. 1, 1876, and all sales made from manufacture.

Respectfully, DAVID W. POND, Successor to LUCIUS W. POND.

Proposals will be received up to December 1st 1876, by the Trustees of the New York and Brooklyn Bridge, at their office 21 Water St., Brooklyn, N. Y., for the manufacture and delivery of 3400 net tons of No. 8 Galvanized Steel Cable Wire, to be used in the construction of the main cables of the East River Suspension Bridge.

Printed specifications containing full information will be furnished upon application to this office.

W. A. ROEBLING, Chief Engineer.

## SECOND - HAND Machine Tools.

Five 15 in. swing 6 ft. bed Screw Cutting Engine Lathes. One 21 in. swing 8 ft. bed Screw Cutting Engine Lathe. One 14 in. swing 4 1/2 ft. bed pulley lathe. One 13 in. swing 5 ft. bed, pulley foot lathe. Six Common Milling Machine. One No. 3 Smith & Garvin Milling Machine. One No. 4 Smith & Garvin Milling Machine. One 2 Spindle Profiling Machine. One 1 Spindle & Whitney Shaper; one No. 3 Brown & Sharpe Screw Machine with chasing bar. Three 4 Spindle Drills. One No. 3 Fowler Press. One 2 in. Bolt Cutter. Four No. 1 "Pond" Drills 21 inch swing. One 5 ft. Radial Drill. One 24 in. 15 ft. Planer.

The above tools have been little used, will be sold very low and can be seen at the store of

GEORGE PLACE, 121 Chambers & 103 Reade Streets, N. Y.

## ALLIS, BULLARD &amp; CO. (Limited),

Railway Supplies, Machinery & Metals, 14 Dey Street, New York,

Offer for immediate delivery the following list of Tools and Machinery, viz:

One 12 x 36 inch Greene Cut-off Engine, in perfect order; one Brown & Sharpe Universal Milling Machine; one No. 1 Screw Machine with lot of Tools; one 8 inch Frail & Whitney Shaper; one 10 in. 16 inch Planer, and 13 inch x 4 feet Lathe; one Pond Planer, 23 x 5 ft.; two Fowler Presses, one 800 lb. Merrill Drop, and 15 and 18 inch Lathes; all in excellent condition.

## SPECIAL NOTICE.

Having established ourselves in business in this city for the sale of

AMERICAN HARDWARE, HOUSE-FURNISHING GOODS, AGRICULTURAL IMPLEMENTS, Etc.,

we beg to solicit correspondence with parties desirous of being represented by us in Germany and surrounding countries.

HAMMACHER & DELIUS.

HAMBURG, Germany, April, 1876.

House in N. Y., A. HAMMACHER & Co., 209 Bowery.

## MANUFACTURERS

desirous of introducing their goods to the British and Continental Markets, are advised to insert advertisements in the newspaper "IRON," published every Saturday, at 99 Cannon Street, London, E. C.

SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

## Steel Castings.

Solid and Homogeneous. Guaranteed tensile strength, 25 tons to square inch. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price list to

CHESTER STEEL CASTINGS CO.,

Evclina St., Philadelphia, Pa.

ATTENTION is invited to the fact that the Labels used on my Goods, were entered according to Act of Congress in the year 1876, in the U. S. Patent Office.

IN ADDITION to Auger Bits, I make a full line of Extension Tip, Car, Machine, Dowel and Hand Rail Bits, also of Boring Machine, Carpenters' and Millwrights' Augers. All my goods are solid CAST STEEL, and perfectly made by means of my Patent Machinery.

## SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1862; January 31, 1866, and July 3, 1866. There is a special claim on each of the Dies. All persons infringing on said patents will be held responsible to the extent of the law. Russell Jennings.

DEEP RIVER, Conn., Sept. 7, 1874.

## Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established.

Address CAR WHEEL FOUNDRY,

P. O. Box 134, Selma, Alabama.

## Briesen's Patent Agency

FOR SECURING INVENTIONS, TRADE

MARKS, &c., IN AMERICA

AND EUROPE.

No. 258 Broadway, New York.

A. V. BRIESEN.

## VENTILATING &amp; STEAM HEATING.

A thoroughly competent engineer, with extensive experience in the above line, desires employment.

Address M., Office of The Iron Age, 10 Warren St., N. Y.

## Special Notices.

## A. PURVES &amp; SON,

Corner South & Penn Streets, Phila., Dealers in

Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass. Cash paid for all kinds of Metals and Tools.

## FRANKLINITE IRON ORE.

The average assay of this ore yields 67 oxide iron, 17.05 oxide of manganese, no sulphur or phosphorus. The large percentage of manganese renders this ore valuable for steel making or mixing with other iron ore. 10 to 12 per cent. of this ore used in puddling furnaces cures red short and cold short in the iron; refined at Sterling Hill, Sussex County, New Jersey. Parties wishing to purchase or contract for future delivery of this ore, can address

DIXON & TROTTER, 35 Spruce St., N. Y.

20 tons residuum of this ore, after zinc is burnt out, for sale.

## EXPORT TO RUSSIA!

Having established ourselves in this city for the sale of American Machinery, Hardware, Agricultural Implements and Technical Products generally, we beg to solicit correspondence with manufacturers desirous of being represented in Russia. Familiar with the wants of the country, and, as civil engineers, brought in contact with the industrial interests, we are enabled to introduce successfully American products to the trade.

Address HARTOCH BROS., Kasanska 46, St. Petersburg, Russia.

## Edson's Steam and Pressure Recording

Gauge for Steam or Water.

The inventors of this combined "Pressure Recording Gauge" and "High Pressure Alarm" have, after many years of persistent effort and at great expense, succeeded in perfecting a reliable and accurate instrument for measuring either air, steam or water, when subjected to pressure, and for denoting the same by a tracing upon Edson's Patent Logs or "Charts." No manufacturer or steam user can afford to be without them. Adopted by the United States Centennial Commission for competitive test at the present Exposition, and has also been used by the American Institute for several years past as a standard gauge. To be found at the Centennial Exhibition under D-9, column 67, Machinery Hall. Circulars sent on application to

M. B. EDSON, 91 Liberty Street, N. Y.

WANTED.—The advertiser desires employment, is familiar with the American and Foreign branches of the Hardware business, is qualified to perform the duties incident to an agency, local or otherwise, or that of general salesman; has an extended business acquaintance in the West and Southwest. Can furnish the very highest reference. Address, F. GRENVILLE, Office of The Iron Age, 10 Warren St., N. Y.

## DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

## Iron and Steel Drop Forgings

in quantities to order at reasonable rates.

HERMANN BOKER & CO., Proprietors, 101 & 103 Duane St., N. Y.

## For Sale, &amp;c.

## For Sale.

The entire interest in one of the most salable patented articles in the United States. Also, machinery for manufacturing in large quantities, or will exchange for stock of merchandise in good location. Satisfactory reasons given for selling. None need apply except those who mean business.

Address, BOX 65,

1 Lyons, Iowa.

## MACHINERY FOR SALE.

One new Tank Locomotive 24 inch gauge, cylinders 9 inch bore, 19 inch stroke, drivers with steel tires, weight about 6 tons. Also a second-hand Vertical Engine, 16 inch bore, 16 inch stroke of cylinder, fitted with independent cut-off. All in first-rate order. Address,

WARD, STANTON & CO.,

Newburg, N. Y.

## For Sale.

Stock of general Hardware business, long established, doing a good business, 140 miles southwest of Cleveland, O., and 110 miles north of Cincinnati, O. For particulars, address

J. N. A., Box 194,

Bellefontaine, O.

## For Sale.

The oldest established Hardware and Stove House in Central Missouri, in a city of 10,000 inhabitants, and doing a thriving business. Reason for selling, sickness in family. For information refer to

SARGENT & CO., 37 Chambers St., N. Y.,

or address, ELIAS BIXBY,

Box 196, Sedalia, P. O., Mo.

## For Sale!

Owing to the death of the senior partner, the surviving partner is desirous of disposing of that part of the business of the firm comprising the Stove and Tin trade. Would dispose of the entire business, including Agricultural Implements, Hardware, Paints, Oils, &c., if desired. Terms easy with good security.

L. PEASE & SON,

Hartford, Vermont.

## For Sale,

30,000 acres of Iron Ore and Timbered Land, large water powers, furnace and forge producing best quality, at good profit and sale. Accessible to Western and Eastern markets.

OWNER,

271 N. Charles St., Baltimore, Md.

## FOR SALE.

at 10c. a copy, Weekly Spanish Review and Prices Current. The undersigned is also a Translator from and into the English, Spanish, French and German. Latest

Translations made: for the governments of Germany and Spain, Pacific Mail S. S. Co., Walter A. Wood, Morris, Wheeler & Co., Todd & Bafferty, John T. Dunkin, Fisk & Hatch; R. W. Wilde; Wilson Sewing Machine Co.; J. Hess & Co.; H. Marquardt; M. Echeverria & Co., and Chas. E. Little, New York; Hocking Valley Mfg. Co., W. F. Potts, Son & Co., Phila.; Atlantic and Pacific Land Co.; B. E. Flemming, Jersey City; Wilder & Co., Savannah, and the Tanite Co.; Stroudsburg ("Emery Grinder"), Abendroth & Root Mfg. Co., to whom he refers.

Estimates furnished of translations and setting up of Spanish, German and French Catalogues for the Centennial.

C. KIRCHHOFF,

Metal Reporter of "The Iron Age,"

Box 3091, New York, P. O.



# Trade Report.

Office of The Iron Age.  
WEDNESDAY EVENING, Sept. 27, 1876.

During the past week there have been many gratifying indications of continued improvement in general trade, and reports from all parts of the country are entirely satisfactory as showing that the revival is by no means local in its character. The money market continues easy. The rates to borrowers on call have been 1½ @ 2½ per cent., according to collateral pledged. The discount rate on prime mercantile paper is 4 @ 6 per cent.

In the gold market there have been no movements of general interest. There has been a good borrowing demand for cash, gold, during the week, and the supply is adequate to the requirements of the market. The following table shows the daily range of the premium:

	Highest.	Lowest.
Thursday.....	110	109½
Friday.....	110½	109½
Saturday.....	110½	110
Sunday.....	110½	110
Tuesday.....	110½	110
Wednesday.....	110½	109½

Government bonds have been quiet and strong. The Syndicate continue to receive a good many subscriptions from banks in this country for the 4½ per cent. bonds. Another call for \$10,000,000 5-30 6 per cents has been issued by the Treasury, making the total amount thus far called \$40,000,000; it is expected that another call for \$10,000,000 will be issued during the coming week. State bonds were strong for Missouri 6s, and others were steady. Railroad bonds have been strong, with an upward tendency. We give below the closing quotations of governments.

In the stock market the feature of interest has been the bear attack upon N. Y. Central, which was terminated by a card from Mr. W. H. Vanderbilt, vice-president, which makes a satisfactory showing as to the financial condition of the road. Coal stocks have not experienced any improvement. The market has been in the main weak. The principal transactions have been in N. Y. Central, Lake Shore, D. L. and W., Western Union, N. Y. Central, Michigan Central, Milwaukee and St. Paul and Northwest. We give below the prices of active shares at the close of business to day.

The bank statement rendered on Saturday shows a decrease in the total reserve of \$5,059,700, and in the surplus reserve of \$4,419,025. The reduction in the reserve was due, so far as loss in specie is concerned, to payments into the Treasury by the Syndicate for 4½ per cent. bonds; and, so far as the loss in legal tenders is concerned, to the beginning of the usual autumn outflow of currency to the South and West. The following is a comparison of the bank averages for the past two weeks:

	Sept. 16.	Sept. 23.	Differences.
Loans.....	\$26,630,000	\$26,820,000	Inc. \$190,000
Legal tenders.....	\$2,434,200	\$2,397,700	Dec. \$36,500
Legal tenders.....	\$2,434,200	\$2,397,700	Dec. \$36,500
Deposits.....	\$24,194,100	\$24,165,400	Dec. \$28,700
Circulation.....	\$14,435,000	\$14,374,800	Dec. \$60,200

The following tables show the movements in foreign trade for the week:

IMPORTS.			
For the week ended Sept. 23.			
	1874.	1875.	1876.
Total for week.....	\$7,593,092	\$6,292,449	\$6,365,551
Prev. reported.....	\$25,437,515	\$25,630,387	\$26,003,477
Since Jan. 1.....	\$332,940,607	\$327,922,636	\$315,371,038

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value.
Anvils.....	1	\$74
Brass goods.....	6	\$49
Bismuth.....	4	\$1,533
Bronzes.....	23	\$5,283
Chains and anchors.....	31	1,479
Cutlery.....	85	38,658
Gun.....	5	1,437
Hardware.....	5	292
Iron, pig, tons.....	808	15,141
Iron, sheet, tons.....	46	7,430
Iron cotton ties.....	787	1,084
Iron, other, tons.....	130	1,732
Lead, pigs.....	582	5,822
Lead, goods.....	1,846	10,221
Metals goods.....	440	18,475
Nails.....	4	210
Needles.....	4	8,392
Nickel.....	1	213
Old metal.....	5,302	3,148
Per. caps.....	30	1,005
Saddlery.....	552	11,148
Steel.....	12	695
Silverware.....	20,021	110,814
Tin, boxes.....	79,534	13,017
Tin, 1,816 slabs.....	341	2,646
Wire.....	83,322	5,040
Zinc, lbs.....		

EXPORTS EXCLUSIVE OF SPECIE.

For the week ended Sept. 26.			
	1874.	1875.	1876.
Total for week.....	\$5,278,750	\$4,100,294	\$5,250,475
Prev. reported.....	\$212,718,745	\$181,909,302	\$192,093,194
Since Jan. 1.....	\$217,992,504	\$186,000,496	\$197,579,694

EXPORTS OF SPECIE.

For the week ended Sept. 23.			
	1874.	1875.	1876.
Total for week.....	\$185,455		
Previously reported.....			\$40,263,445

Total since Jan. 1, 1876.			
	1874.	1875.	1876.
Same time in 1875.....	\$40,448,900		
Same time in 1874.....	\$4,873,174		
Same time in 1873.....	42,404,045		
Same time in 1872.....	41,587,331		
Same time in 1871.....	57,968,178		

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6s.....	120½	120½
U. S. 6s 1881, reg.....	117½	117½
U. S. 6s 1881, con.....	118½	118½
U. S. 5-30 1885, reg.....	113	113½
U. S. 5-30 1885, con.....	113	113½
U. S. 5-30 1885, new reg.....	113½	113½
U. S. 5-30 1885, con.....	113½	113½
U. S. 5-30 1887, reg.....	116½	116½
U. S. 5-30 1887, con.....	116½	116½
U. S. 5-30 1888, reg.....	118½	118½
U. S. 5-30 1888, con.....	118½	118½
U. S. 10-40 reg.....	114½	114½
U. S. 10-40 con.....	115½	115½
U. S. 5s 1881, reg.....	114½	114½
U. S. 5s 1881, con.....	114½	114½
U. S. 4½.....	111½	111½

The following are the closing quotations of active shares:

	Bid.	Asked.
Atlantic & Pacific R. R. Preferred.....	9	9½
Atlantic and Pacific Telegraph.....	10½	10½
Chicago & Northwestern.....	32½	32½
Chicago & North Western.....	32½	32½
Chicago, Rock Island and Pacific.....	58½	58½
Chic. & Quincy.....	114	115
Col. Chic. & Ind. Cent.....	3½	4
Clev. Col. Cin. and Indpls.....	35½	35½

Cleveland and Pittsburgh.....	87	87½
Chicago & Alton.....	97½	97½
Chicago and Alton Preferred.....	108	108
Del. Lack. and Western.....	74½	74½
Delaware & Hudson Canal.....	76½	76½
Adams Express.....	107	107
American Express.....	59	59½
United States Express.....	61½	61½
Wells, Fargo & Co. Express.....	73½	73½
Eric.....	10	10½
Harlem.....	13½	13½
Hannibal & St. Joseph.....	12	12½
Illinois Central.....	83½	84
Kansas Pacific.....	8	8½
Kansas & Texas.....	7½	7½
Lake Shore.....	52½	52½
Michigan Central.....	40½	40½
Milwaukee & St. Paul.....	39½	39½
Milwaukee & St. Paul.....	39½	39½
Mariposa.....	59½	60
Mariposa.....	59½	60
New York Central.....	97½	97½
New Jersey Central.....	25½	25½
Ohio & Mississippi.....	11½	11½
Pacific Mail.....	32½	32½
Panama.....	130	130
Pittsburgh & Fort Wayne.....	100	100½
Pacific of Missouri.....	8	8
St. L., Kan. City Northern.....	5	5
Tol., Wabash & Western.....	4½	4½
Union Pacific.....	61	62
Western Union Telegraph.....	69½	69½

## GENERAL HARDWARE.

Trade in seasonable goods is steadily increasing in volume, and some of our city houses have all the business they can well attend to. Prices are remarkably steady, and the few changes which have occurred during the week are of secondary importance.

The Russell & Erwin Mfg. Co. have increased their production of Screws, and accumulated a fair stock of the regular sizes. They inform us that they are prepared to fill orders of reasonable size. They still adhere to the terms of their circular of August 15th, both as regards price and manner of filling orders.

In Foreign Hardware we notice increased activity and steady values. Peter A. Frasse & Co., No. 95 Fulton street, have in stock a full assortment of Stub's Files, which they offer to the trade at lowest market rates. They are also sole agents for Thos. Turner & Co.'s (Sheffield) Files and Horse Raps, which they quote from stock at \$4.50 to \$5, gold, for Files, and \$5 to \$7, for Raps. P. F. & Co. also make a specialty of fine tools for machinists' use, Stub's Steel Wire, &c. The house of Peter A. Frasse & Co. has attained a ripe old age, being established by the father of the present senior member of the firm in 1816, at which time, although it did not occupy the same building in which the firm do business at present, it occupied precisely the same ground.

The demand for Nails, though not so brisk as in former years, is fair, and orders are coming in freely. The stocks in this city and at the mills are lighter than is usual at this season, and, as a rule, the assortments are broken. The quantity sold so far this month is equal to the amount sold for the same time in September, 1875. The price continues firm at \$3 per keg for 10d. for lots of 200 kegs and over, and \$3.10 for lots under 200 kegs.

J. Clark Wilson & Co. have issued the following price list for Eastern Pattern Cow Ties, under date of 25th inst. They say of these goods:

These Cow Ties have been expressly made for the Eastern trade, and with special view to security. An extension knob has been formed on the open ring to prevent the same from drawing through the loop. This drawing through and closing up of the ring upon the stanchion is a fault which has been much complained of by the farmers, and has never before been obviated. The swivel also connects with the loop without any intervening link, thus greatly decreasing the danger of the animal getting his foot over it. The spring hook being made of malleable iron, is less liable to be straightened out than if made of wrought iron.

## EASTERN PATTERN COW TIES.

Price List in Gold.			
With Snap.			
Per doz.....	\$2.80	\$2.75	4.25.
3, 10, 6.	3½, 10, 5.	4, 10, 4.	4½, 10, 3.
With Toggle.			
Per doz.....	\$2.40	\$2.35	3.21.
3, 10, 6.	3½, 10, 5.	4, 10, 4.	4½, 10, 3.

Ward B. Snyder, manufacturer of the Little Giant Steam Engine, has moved to his new store, No. 94 Fulton street, N. Y., where he has also a fine stock of sporting goods.

The Russell & Erwin Mfg. Co. quote Champion Cross-cut Saws at 65 cents per foot, discount 30 per cent., and Tucker's Alarm Tills No. 1, discount 33½ per cent.

We published last week an article illustrating Mrs. Susan R. Knox's Improved Fluting Machine, the list for which is for 6 inch \$5.20, discount 20 and 10 per cent., instead of \$4.15, with same discount, as printed. Sargent & Co. are the agents for this machine.

The Middletown Tool Company and W. & E. T. Fitch have issued the following revised price list and terms for Henshaw's Patent Harness Snaps:

## REDUCTION IN PRICE OF HENSHAW'S PATENT HARNESS SNAPS.

MIDDLETOWN, CONN., Sept. 22, 1876. Hereafter, or until further notice, our discount from list of Henshaw's or Bristol's Patent Harness Snaps, respectively, will be 50 per cent., net cash. The only change in our list is an advance of 1 per cent on 1½ inch, which makes the present list price \$14. Please note this change and favor us with your orders.

MIDDLETOWN TOOL COMPANY, W. & E. T. FITCH.

## Henshaw's Patent Harness Snaps.

	Per gross.
¾ in., ¾ in., 1 in.....	\$10.00
1½ in., Round Eye.....	14.00
1½ in., Round Eye.....	13.00
1½ in., Round Eye.....	13.00
¾ in., Round Eye.....	14.00

Graham & Haines have been appointed sole agents for the Oswego Fork Mills, of Girard, Pa., manufacturers of Hay, Manure and Spading Forks, Rakes, and other agricultural tools. The goods are handsomely finished, and will compare favorably with any similar line in the country. They offer these goods either from store or factory at lowest factory rates. We mentioned some time ago that Graham & Haines had been appointed sole agents for Klotman, Park & Co., of Pittsburgh, Pa. They

have issued the following net price list for their goods:

Iron City Tool Works—Klotman, Park & Co.  
Solid Box Vises.  
35 to 130 lbs. .... \$10.13½ Above 140 lbs. .... \$10.14½

Boxes and Screws.  
Net, each.  
30 to 40 lb. Vise.....\$3.50 60 to 100 lb. Vise.....\$5.25  
50 to 60 " ".....3.75 110 to 130 " ".....6.50  
70 lb. Vise.....4.25 Above 130 " ".....7.00  
80 " ".....4.50

Smith Sledges.  
Steel Face and Pene, 6 to 25 lbs. .... Per lb.  
Ex. Cast Steel Pene, Polished, 6 to 15 lbs. .... \$10.11½  
Solid " Polished, all bright.....34  
" " all Black, polished Face.....27  
" " half Bright.....29

Smith Hand Hammers.  
2 to 5 lbs., Steel Face and Pene.....\$10.17  
Steel Face and Pene, extra finish.....33  
Solid Steel, Black, 2 to 5 lbs.....19  
Bright, 2 to 5 lbs.....35

Engineer Sledges.  
Cast Steel, Plated, 6 to 25 lbs. ....\$10.11½  
" above 25 to 30 lbs.....12  
Solid, Polished, bright.....33  
" half bright.....29  
" Black.....27

Stone Sledges.  
Cast Steel Face and Pene, 6 to 25 lbs. ....\$10.11½  
Solid Cast Steel, polished, 6 to 30 lbs. ....34  
" half bright.....29  
" all black, 6 to 30 lbs.....27

Striking Sledges.  
Cast Steel, plated, 6 to 25 lbs., face polished.....\$10.11½  
Common Finish, 7 to 8 lbs.....19  
Polished, all bright.....33  
Black, polished face.....27

Stone Cutters' Tools.  
Mason Hammers.  
C. S. Head and Edge, common polish.....\$10.17  
Common Finish, 7 to 8 lbs.....19  
Solid Steel, polished, 6 to 30 lbs.....34  
" half bright.....29  
" Black.....27

Double Head, Axe Finish, plugged.....30  
Solid Steel, bright.....35  
" Black.....31  
Double Edge, Axe Finish.....19  
C. S. bright.....35  
" Black.....31

Stone Mash Hammers.  
Solid Cast Steel, polished, half bright.....\$10.33  
" common finish.....32  
Stone Napping Hammers.  
Solid Cast Steel, polished, half bright.....\$10.33  
" common finish.....32  
Iron, Steel Faced.....30

Stone Picks.  
Axe Finish, 7 to 8 lbs.....per doz. \$13.50  
Common Finish, 7 to 8 lbs.....13.00  
Stone Wedges, Cast Steel.....per lb. 26  
Iron refined.....11

Mattocks.  
Long Cutter, Axe Finish.....per doz. \$12.00  
Short ".....11.75  
Pick Mattocks.....12.00

Grab Hooks—Cast Steel Point, Axe Finish.  
No.....0 1 2 3  
Per dozen.....\$9.00 8.50 9.00 9.50

Railroad Picks.  
R. R. Picks, Adze Eye, Axe Finish.  
Lbs.....4 to 5 5 to 6 6 to 7  
Per doz.....\$8.00 8.50 9.00

Clay Picks, Adze Eye, Axe Finish.  
Lbs.....4 to 5 5 to 6 6 to 7  
Per doz.....\$8.00 8.50 9.00

Railroad Tamping Picks.  
Adze Eye, Axe Finish.....\$12.50  
Solid Pick Eyes.....per lb.  
Drifting Pick Eyes.....19  
Ball Pick Eyes.....19

Drifting Picks.  
No. 1, 3 lbs.....\$13.00 No. 4, 5 lbs.....\$14.50  
No. 2, 4 lbs.....13.50 No. 5, 6 lbs.....15.00  
No. 3, 4½ lbs.....14.00 No. 6, 6½ lbs.....16.00

Poll Picks.  
No. 1, 3½ lbs.....\$14.00 No. 4, 5½ lbs.....\$15.50  
No. 2, 4½ lbs.....14.50 No. 5, 6½ lbs.....16.00  
No. 3, 4½ lbs.....15.00 No. 6, 6½ lbs.....16.50

Railroad Spike Mails.  
Plugged, Cast Steel Face, from 6 to 10 lbs. .... Per lb.  
Solid Steel, common finish.....\$10.12  
" half bright.....27

Crowbars.  
Steel Pointed, hammered, wedge and pinch point, from 10 to 30 lbs.....\$10.06  
Steel Pointed, hammered, wedge and pinch point, from 30 to 75 lbs.....07

Claw Bar, Steel Claw.....11  
Tamping Bar, Steel Temper.....07  
Stone Drills, Steel Ends.....07  
Ball Drills.....09

Cold Chisels.  
Solid Cast Steel, Plain Head, ¾ and 1 inch.....\$10.34  
" " Mallet, ¾ and 1 ".....41  
" " " ¾, ¾, and 1 " and up.....45

Mill Picks.  
Solid Cast Steel, polished.....\$10.65  
" Black.....27

Coopers' Froes.  
C. S. Edge, polished, 10 to 12 inch.....per doz. \$10.50  
" 13 to 16 ".....10.00

Coopers' Hammers.  
Solid Cast Steel, all bright.....per lb. \$10.44  
" Black.....37  
Iron, Steel Faced.....21

Coal Picks.  
Cast Steel Point, Axe Finish.....\$10.50 No. 2, 3  
" all black.....6.00 6.50 7.00

Coal Wedges.  
Solid Cast Steel, 2 to 4 lbs.....per lb. \$10.20

Coal Sledges.  
Cast Steel Face, polished, 5 to 9 lbs.....per lb. \$10.12½  
Solid Steel, polished, 5 to 9 lbs.....16  
" all black 5 to 9 lbs.....27  
" below 5 lbs.....32  
" half bright, below 5 lbs.....35

Coal Miners' Lamps.  
Hoover's Lamp.....per gross, net.....\$13.50  
Common ".....10.50

Boat Spike Mails.  
Axe Finish.....per lb. \$10.21  
Solid Cast Steel, ass'd, half polished.....34

Belows.  
Discount, 25 per cent. off list. Net.

We have received from the McNab & Harlin Manufacturing Co., of 56 John street, New York, a large and very elegant illustrated catalogue for 1876 of their different manufactures. It is accompanied by a very convenient pocket price list, which is fully indexed. Upon the title page we note the fact that this is the fifth edition of the catalogue. In printing, paper, binding and general taste of get up it deserves great praise. It is worthy of note that the engravings of a character to show just the points and features of an article which the buyer wishes most to understand—a thing which is too often neglected in catalogues. The line of goods shown is very large, as may be judged from the fact that the catalogue contains 300 quarto pages. Among the lines of goods illustrated we note especially large Iron Pipe and Fittings, Iron and Brass Valves, and Steam Fittings generally, Boiler Makers' and Steam and Gasfitters' Tools, and Plumbers' Materials.

E. S. & J. Torrey have disposed of the Weather Strip branch of their business to S. Roebuck, who will continue the manufacture of these goods at their old stand, No. 166 Fulton street. E. S. Torrey will continue the manufacture of Door Springs and Ice Cream Freezers at 195 Fulton street.

## BRITISH IRON MARKET.

(Specially reported by cable for The Iron Age.)

WEDNESDAY, Sept. 27, 1876.

Scotch Pig.—The market is active, the demand improving, and prices are advancing. The following are makers' quotations:

Garthshrie No. 1.....65.6  
Coltness No. 1.....68.6  
Glenasmole No. 1.....63.6  
Eglinton No. 1.....57.6

Manufactured Iron and Rails are unchanged.

## IRON.

American Pig.—Iron is selling in a small way without any noticeable feature. Prices are the same, and are well maintained. There seems to be a somewhat more hopeful feeling, but it is not based on any change in the conditions of the trade, but caused by the activity of some other branches of trade. There are no sales of importance to report. The Andover Iron Company have blown in one of their three furnaces, and are running on Forge. We quote: No. 1 Foundry, \$22; No. 2 Foundry, \$30; Gray Forge, \$19 @ \$20.

Scotch Pig.—There is no change, and we continue our quotations, viz.: Coltness, \$28.50; Glenasmole, \$27.50; Eglinton, \$26.50.

Rails.—There is no change in prices to note. Recent sales of Steel have reduced the anxiety of producers to sell, while buyers are holding out for lower prices.

Old Rails.—There have been no recent sales, the latest having been at \$20.

Scrap.—The market remains as last reported, and we quote Wrought from yard, \$26 @ \$27.

## METALS.

Copper.—Sales for the week sum up between 400,000 and 500,000 pounds Lake Superior on the spot and to arrive







**300 Broadway, New York.**

**SCOTCH PIG IRON**

has been thoroughly quiet during the week, prices of all kinds having been steady, although somewhat in favor of larger buyers. There are now 82,646 tons in Connal's stores, freights being as retorefore.

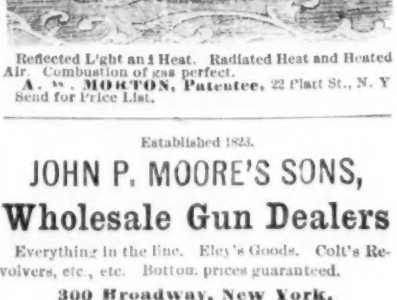
James Watson & Co. report: "The market for Scotch pig iron has been very steady during the week, from 55/11 to 56/, cash, and one month fixed, closing rather buyers at 56/, cash. Shipments last week were 9637 tons, against 10,616 tons in the corresponding week of 1875." We quote :

	No. 1.	No. 3.
G. M. B. at Glasgow .....	56/6	54/6
Cart-harris, " .....	56/7	56/
Coltness, " .....	67/	56/
Summerlee, " .....	60/	54/6
Langdon, " .....	65/	55/6
Marble, " .....	65/	54/6
Calder, at Port Dundas .....	64/6	55/
" ; Jernagorok, at Ardrossan .....	66/6	56/
Edinon, " .....	52/6	55/
Shotts, " .....	55/6	54/
Shuttle, at Leith .....	56/	55/6
Kinnell at Bo'ness .....	57/	53/6

The figures of John E. Swan & Bros. are, in some cases, sixpence per ton lower than the above.

**CLEVELAND IRON-MASTERS' RETURNS.**

The usual monthly statement just issued by the Cleveland Iron-masters' Association shows





(Continued from page 15.)

Holmes, Booth & Hayden, Waterbury, Conn., Brass and Copper (Rolled Wire) Tacks and Rivets, Forks and Spoons.  
 Lewis, Oliver & Phillips, Pittsburgh, Wagon Hardware, Hinges, Bolts, etc.  
 E. & G. Brooke, Birdsboro, Pa., Nails, Brads and Spikes.  
 Dunbar, Hobart & Co., South Abington, Mass., Tacks, Trunk and Clout Nails, Heel and Toe Plates.  
 Holly Mfg. Co., Lakeville, Conn., Pocket Cutlery.  
 Pennsylvania Galvanic Co., Philadelphia, Galvanized Ship Hardware, etc.  
 Riverside Iron Works, Wheeling, W. Va., Cut Nails.  
 William E. Quigley, Waterbury, Conn., Horseshoes.  
 H. Burden & Sons, Troy, Horse and Mule Shoes.  
 Rhode Island Horseshoe Co., Providence, Patent Hammered Machine Horseshoes.  
 Aaron W. Smith, Manchester, N. H., Flexible Horseshoes.  
 S. S. Putnam & Co., Neponset, Mass., Horse Nails.  
 National Horse Nail Co., Vergennes, Vt., Horse Nails.  
 Henry Disston & Sons, Philadelphia, Saws, Trowels, Plumbs, Levels, Squares, Hinges, etc.  
 Nicholson File Co., Providence, R. I., Files and Rasps.  
 S. G. Flagge & Co., Philadelphia, Steel, Gray Iron and Malleable Castings, Pipe Fitting.  
 Freeman K. Sibley, Waltham, Mass., Emery and Crocus Paper.  
 Benjamin Forstner, Salem, Oregon, Patent Perpetual Lip Auger Bits.  
 Post & Co., Cincinnati, Padlocks, Car and Door Locks, Hinges, etc.  
 L. Sykes & Son, Philadelphia, Nuts, Bolts, Turnscrows, Washers, etc.  
 Enterprise Mfg. Co., Philadelphia, Sad Irons, Coffee Mills, Tobacco Cutters, etc.  
 Eben Moody Boynton, New York, Saws.  
 Bader, Adamson & Co., Philadelphia, Sand Paper, Emery Paper and Emery Cloth.  
 Stevens Patent Vise Co., New York, Parallel Vises and Planer Chucks.  
 Western File Works, Beaver Falls, Pa., Files and Rasps, etc.  
 Fisher & Norris (Eagle Anvil Works), Trenton, N. J., Anvils, Vises, etc.  
 McCaffrey Bros., Philadelphia, Hand-cut Files and Rasps.  
 G. & H. B. Smith (Black Diamond Works), Philadelphia, Hand-cut Files and Rasps.  
 Douglass Mfg. Co., Seymour, Conn., Chisels, Augers, Auger Bits, Draw Knives.  
 H. Hammond & Co., Hartford, Conn., Steel Hammers and Drop Forgings.  
 I. H. Sternberg, Reading, Pa., Bolts, Nuts, etc.  
 A. G. Coes & Co., Worcester, Mass., Screw Wrenches.  
 Morse Twist Drill and Machine Co., New Bedford, Mass., Screw Plates, Wrenches, Stocks, Dies, Chucks, etc.  
 W. C. Allison & Sons, Philadelphia, Bolts, Nuts, Screws, Rivets, etc.  
 Hoopes & Townsend, Philadelphia, Bolts, Nuts, Screws, Rivets, etc.  
 Pennsylvania Tack Works, Norristown, Pa., Tacks, Shoe Nails, etc. (Copper and Iron).  
 American Saw Co., Trenton, N. J., Circular Mill, Cross-cut Saws.  
 Edward H. Knight, Philadelphia, Patent Wrench (adjustable).  
 J. M. Carpenter, Pawtucket, R. I., Stocks with Taps and Dies.  
 S. H. Quint & Co., Philadelphia, Stencils, Pattern Letters, etc.  
 Clough & Williamson, Newark, N. J., Wire Corkscrews.  
 W. F. Palmer, San Francisco, Axes, Hatchets, Adzes, Chisels, Draw Knives.  
 Alexis Zivabaff, Russia, Nijni Novgorod, Table and Pocket Cutlery, Shears, heavy Pruning Knives.  
 H. Denizet, France, Langres, Shears, Knives, etc.  
 A. Gallais, France, Paris, Upholsterers' Nails, etc.  
 Thinet, France, Paris, Cutlery.  
 J. Claudon, Thullier, France, Nogent, Scissors and Shears.  
 Thuillier, Thomachot, France, Nogent, Shears.  
 C. Sommelet, France, Courcelles, Cutlery.  
 Guillemin Renaud, France, Nogent, Cutlery.  
 Limet La Parieille & Co., France, Paris, Files, Rasps, etc.  
 P. & N. Nicaise, Belgium, Marcinelle, near Charleroi, Bolts and Rivets.  
 Adolphe Fix, Belgium, Brussels, Iron and Brass Nails.  
 H. Boker & Co., Germany, Solingen, Cutlery.  
 Henry Ottomann Friedrich Bieckfeldt, Germany, Swatzenburg, Tinned Iron Spoons and Forks.  
 Louis Rohle, Germany, Dresden, Knobs and Door Trimmings.  
 R. & H. Vorster, Germany, Hagen, Edge Tools.  
 Wilhelm Eisenfuhr, Germany, Berlin, Stocks and Dies, Rammer, etc.  
 J. S. Holler & Co., Germany, Solingen, Cutlery.  
 T. Hessebruch & Co., Germany, Ronsdorf, Tools, Scissors, etc.  
 F. Wellman, Germany, Altona, Cutlery.  
 B. & O. Liberg, Sweden, Eskilstuna, Shears, Chisels, Plane Irons, Gouges, Skates, etc.  
 F. W. Soderen, Sweden, Eskilstuna, Scissors and Shears.  
 J. F. Lindstrom, Sweden, Eskilstuna, Cutting Nippers, Pliers, Pincers and Shoe Punches.  
 A. Halling, Sweden, Eskilstuna, Hunting Knives, Kitchen Knives and Dirks.  
 Fagersta Iron and Steel Works, Sweden, West-anfors, Mill, Cross-cut, Circular and Pit Saws and Stone Hammers.  
 Lejofors Iron and Steel Co., Sweden, Sanga-banshyttan, Wire, Nails, Brads, Tacks, etc.  
 F. A. Stenman, Sweden, Eskilstuna, Locks, Latches, Bolts, etc.  
 Sumbet fils, Switzerland, Geneva, Tools and Instruments for Watchmakers.  
 S. L. Vautier & Sons, Switzerland, Geneva, Watchmakers' and Jewelers' Tools, etc.  
 H. C. Henkelom, Netherlands, Utrecht, Nuts, Bolts and Spikes.  
 Demetrius Kondraloff, Russia, Madinier, Table, Pocket and other Cutlery.  
 John Kaliakin & Sons, Russia, Nijni Novgorod, Table and Pocket Cutlery, Shears, Pruning Knives.  
 F. A. Keris, Austria, Carlsbad, Tinned Iron Spoons and Forks.  
 Royal Manufactory of Spain, Madrid, Locks, Hinges.  
 Dates Patent Steel Co., Toronto, Ont., Axes and Edge Tools.  
 Joseph Warnick & Co., Galt, Ont., Axes and Edge Tools for Wood, Iron and Stone.  
 W. & M. Ahearn, Ottawa, Ont., Lumbermen's Tools.  
 Peter Robertson, Ottawa, Ont., Lumbermen's and Stonecutters' Tools.  
 Thomas Moore, Cookville, Ont., Axe and Tool Handles.  
 R. H. Smith & Co., St. Catherine, Ont., Saws.  
 Spiller Brothers, St. John, N. B., Edge Tools.  
 S. R. Foster & Sons, St. John, N. B., Nails, Tacks, Brads, etc.  
 Pillow, Hersey & Co., Montreal, Quebec, Nails, Tacks, Brads and Horseshoes.  
 Starr Mfg. Co., Halifax, N. S., Skates.  
 Cowen Gilmore, Canada, Montreal, Augers, Bits, etc.  
 A. S. Whiting Mfg. Co., Oshana, Ont., Forks, Hoes, Scythes, Straw Knives, etc.

J. B. Addis & Sons, Sheffield, Carvers' Tools, Table and Pocket Knives, etc.  
 James Burnand & Co., Sheffield, Fine Cutlery, Patent Bolt and Nut Co., Birmingham, Bolts, Nuts, Spikes, Wrenches, Clinch Rings, etc.  
 Brookes & Crookes, Sheffield, Pocket Knives, Scissors, Razors, etc.  
 George Wostenholm & Son, Sheffield, Pocket Knives, Razors, Scissors, etc.  
 Wilson, Hawksworth, Ellison & Co., Sheffield, Pocket and Table Cutlery, Scissors, Knives and Steel Files.  
 Ward & Payne, Sheffield, Chisels, Braces, Bits, Curvers' Tools, etc.  
 William Baker, London, Turn Screws, Bits, Baling Needles.  
 Mayer & Melzer, London, Pocket Knives, Scissors, Razors, etc.  
 Christopher Baker & Sons, Birmingham, Coffin Trimmings and Door Fittings.  
 William Smith & Son, Warrington, Pliers, Nippers, Vises, Dividers, etc.  
 Wm. Wilkinson & Sons, Sheffield, Sheep Shears, Garden Shears, etc.  
 Wm. Russell, Cincinnati, Horseshoes, Hand and Machine made, etc.  
 B. Haffner, St. France, Paris, Saws.  
 Yale Lock Mfg. Co., Stamford, Conn., Time, Safe, Door and other Locks.  
 Chatwood, Great Britain, London, Fire and Burglar Proof Safes.  
 Hall's Safe and Lock Co., Cincinnati, Safes.  
 Herring & Co., New York, Fire and Burglar Proof Safes.  
 Beard & Bro., St. Louis, Fire and Burglar Proof Safes.  
 Terwilliger & Co., New York, Fire and Burglar Proof Safes.  
 J. Watson & Son, Philadelphia, Bankers', Office and House Safes.  
 Marvin Safe and Scale Co., New York, Fire and Burglar Proof Safes and Combination Locks.  
 Farrell & Co., Philadelphia, Safe Deposit, Bankers' and Office Safes.  
 Sargent & Greenleaf, New York, Combination, Time and other Locks.  
 New Britain Safe and Lock Co., New Britain, Conn., Bank and Deposit Safes, Drawer and other Locks.  
 Valentine & Butler, New York, Fire and Burglar Proof Safes.  
 Corlies Safe Co., Providence, R. I., Burglar Proof Safes.

## Group XXII.

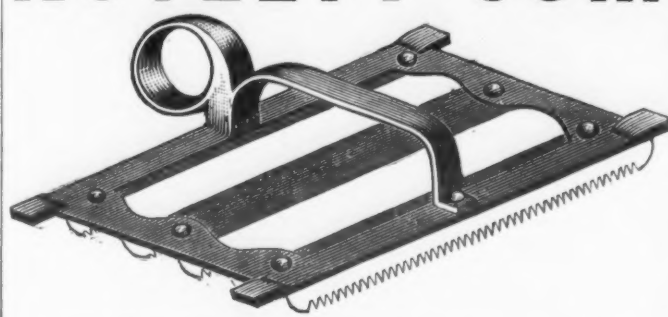
The Billings & Spencer Co., Hartford, Conn., Drop Forge and Cold Pressed Sewing Machine Shuttles.

## Group XXIII.

Auburn Mfg. Co., Auburn, N. Y., Manual Implements of Tillage.  
 Hill's Archimedeon Lawn Mower Co., Hartford, Conn., Lawn Mowers.  
 Tubular Barrow and Truck Mfg. Co., New York, Wheelbarrow.  
 A. J. Nellis & Co., Pittsburgh, Patent Process for Chilling Steel.  
 Rhodes & Waters, Elvira, O., Eureka Post Hole Digger.  
 Oliver Ames & Sons, Easton, Mass., Shovels and Spades.  
 South Bend Iron Works, South Bend, Ind., Chilled Plows and Attachments.  
 Worthington, Cooley & Co., Jackson, Mich., Rakes, Hoes, Forks, etc.  
 Maxwell, Rowland & Co., Philadelphia, Shovels and Spades.  
 Smith & Harper, Philadelphia, Hoes and Rakes.  
 B. Rowland & Co., Philadelphia, Shovels, Spades, Scoops, etc.  
 Henry S. Vanderbilt, Washington, D. C., Wagon Jack.  
 John Ashcroft, Marion, Oregon, Pruning Shears.  
 S. N. Gustino, Mexico, N. Y., Animal Poke.  
 A. J. Nellis, Pittsburgh, Hay Fork, Gripping Claw, etc.  
 Compartment Milk Can Co., Rockport, Vt., Milk Pans.  
 Geo. Bergner & Co., Washington, Mo., Apple and Peach Parers.  
 H. P. Rankins, Allegheny, Pa., Meat Chopper.  
 Frank A. Parker, Reading, Pa., Apple Paring Machines.  
 August Nittinger, Philadelphia, Meat Chopper and Sausage Stuffer.  
 A. C. Cotton, Vineland, N. J., Adjustable Hoes.  
 C. E. Petterson, Sweden, Lango Bruk, Scythe Blades.  
 Geo. Barnes & Co., Syracuse, N. Y., Knives and Sickles.  
 Brown, Hinman & Co., Columbus, Ohio, Hoes, Forks, etc.  
 J. C. Bidwell, Pittsburgh, Plow and Steel Crucible Casting Work.  
 Geo. W. Ruge, Hamilton, O., Potato Digger, Cultivator, Hoes, etc.  
 Russell, Burdall & Ward, Port Chester, N. Y., Bolts and Nuts for Agricultural Machinery.  
 H. Burden & Sons, Troy, N. Y., Model of Horseshoe Machine.  
 A. W. Willis, Birmingham, England, Tools, Hoes, Axes, etc.  
 George Griffith, Philadelphia, Spades and Shovels.  
 Myers & Ervin, Philadelphia, Assortment of Forks.  
 T. Rowland & Son, Philadelphia, Shovels and Spades.  
 Beardsley Scythe Co., Winstead, Conn., Scythes, Grass and Brier Hooks.  
 Balls Scythe Works, Saratoga, N. Y., Grain Scythes and Cradles.  
 Freeman, Valentine & Green, Ithaca, N. Y., Hand Corn Sheller.  
 Dunn Edge Tool Co., West Waterville, Me., Scythe Blades, Grass Hooks, etc.  
 James Fucell, Sons & Co., England, Scythe Blades, etc.  
 R. H. Allen & Co., New York, Horticultural Implements.  
 Royal Furnaces, Germany, Wurtemberg, Scythes.  
 Austrian Commission, Austria, Scythe Blades.  
 P. P. Flowering, Bethesda, Mass., Pruning Shears.  
 Geo. Cheavin, Rapid Water Filters.  
 W. B. Allen & Co., Ogdensburg, N. Y., Gilt Edge Milk Pan.  
 Graham, Enlin & Passmore, Philadelphia, Lawn Mowers.  
 William Wilkinson & Sons, England, Sheep and Hedge Shears.

The Polytechnic Review has the following upon aerial navigation in France: Mons. Rablat is now exhibiting, at the Casino Cadet, a model of an aerial vessel designed to operate without the aid of a balloon, or the use of a gas lighter than air. The inventor has at each side of his vessel three pairs of wings which are actuated by an engine in the hull. The wings are elevated and depressed alternately; made of a light rattan framework and of bands of cloth; they yield to the pressure of the air in the upward movement, and press upon it on the down stroke, reproducing as faithfully as possible the action of the bird's wing. The simple and strong construction of this aerial vessel merits the attention of lovers of aerostation. As to the possibility of elevating and maneuvering in the air such a system, we decline to pronounce, being ignorant of the yet unknown motor which shall give to wings stretching over 12 meters in length an indeterminate number of oscillations per minute.

# HOTCHKISS' PATENT NOVELTY COMBS.



THIS CUT ILLUSTRATES THE GRASPING OF THE COMB.

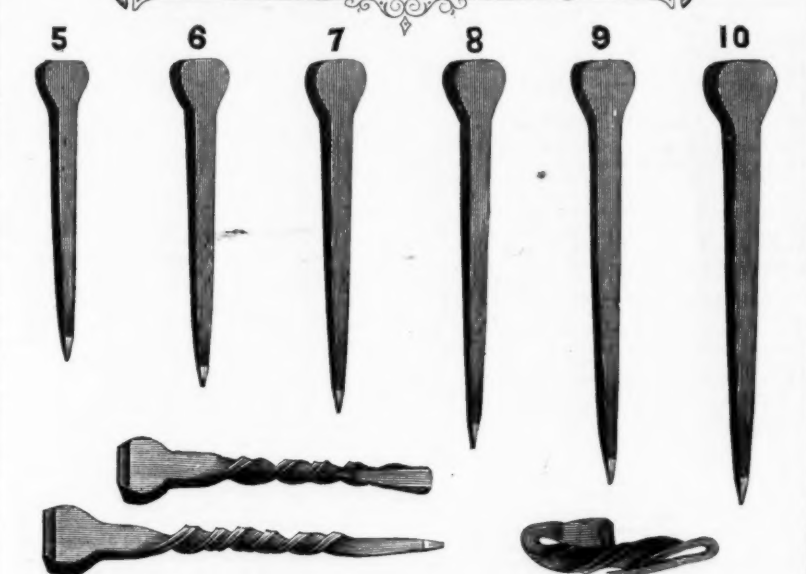


Manufactured by  
**HOTCHKISS' SONS,**  
Bridgeport, Conn.

These Combs do not infringe upon the rights of any one. They are the simplest, neatest and most durable COMBS ever offered to the trade, affording an easy grasp for the hand, without the use of the ordinary side handle, and are universally acknowledged to be superior to all others. They are neatly put up in paper boxes of one dozen each, and packed 24 dozen in a case. Special net prices furnished on application.

## AUSABLE HORSE NAILS

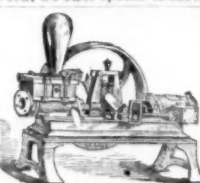
POLISHED OR BLUED.  
HAMMERED AND FINISHED



**The Ausable Nails**  
Are Hammered Hot,  
And the Finishing and Pointing are  
Done Cold,  
Thus Imitating the Process of Making Nails by Hand.  
Quality is **Fully Guaranteed.**  
For Sale by all Leading Iron and Hardware Houses.  
**ABRAHAM BUSSING, Secretary,**  
35 Chambers St., New York.

### DYNAMO-ELECTRIC MACHINES

For Electroplying  
**NICKEL, GOLD, &c.,**  
and other purposes. Send for Illustrated Circular.  
**W. HOCHHAUSEN,**  
132 William Street, NEW YORK.  
P. S. ERNHOUT. E. F. CATLIN  
**ERNHOUT & CATLIN,**  
ELECTRO-PLATERS.  
And Manufacturers of  
Catlin's Combination Inkstand, &c.  
No. 43 GOLD STREET, NEW YORK.  
NICKEL-PLATING AS IS NICKEL-PLATING.  
To manufacturers and others having quantities of new work, we offer special inducements.



**JAS. CLAYTON,**  
Manufacturer of  
Water, Air, and  
Vacuum Pumps and  
Air Compressors.  
Send for Illustrated Circulars.  
11 & 16 Water St.,  
Brooklyn, N. Y.



**SPENCER & UNDERHILL,**  
54 Beekman St., N. Y., Agents for  
American Screw Co., Wood Screws, Hand  
Rail Screws, Stove Bolts, &c.  
O. Ames & Sons, Shovels, Spades and Sonops.  
A. Field & Son, Tacks, Brads &c.  
G. F. Warner & Co., Metal Clamps and an assortment of Builders' Hardware.

## NEW TOOLS

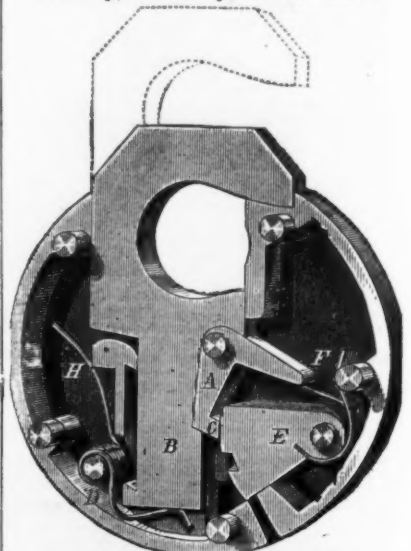
Patented Aug. 10, 1875.  
We beg leave to call the attention of Dealers in Tools and Hardware to these new

### PIN VISES.

These cuts are about two-thirds size, jaws forged steel. The workman-ship is first-class. They please workmen and amateurs.  
Price per doz. \$18 00, with liberal discount.  
Send for lists and discounts to  
H. S. Manning & Co., New York.  
Winne & Campbell, Chicago.  
Howard, Tallman & Co., Philadelphia.  
Jackson & Tyler, Baltimore.  
Chas. Churchill & Co., London, Eng.  
Manufacturers' Agents, or to  
**Lowell Wrench Co.,**  
Worcester, Mass.



**D. H. MILLER LOCK CO**  
712 Cherry St., Philadelphia, Pa.  
Security, Durability, Convenience.



**IMPROVED SELF-LOCKING Brass Pad Locks.**  
Made in the most substantial and compact manner, and are in every respect a superior article. We guarantee that no two locks are alike, unless specially ordered. Each lock furnished with two keys. Any number of locks or keys made to order. Adopted by the United States Government. Samples of No. 1 Lock sent to all parts on receipt of \$1.50. Liberal Discounts in the Trade.

## PYROMETERS for BLAST FURNACES.

**Edw. BROWN,**  
311 Walnut St., Philadelphia.  
ALSO FOR SALE  
**PYROMETERS**  
For Baker's Ovens, Boiler Flues, Galvanizing Baths, Oil Stills, Vulcanizers, Superheated Steam.  
Over 300 "Gauntlett" and 100 Portable Pyrometers are now in use at Blast Furnaces.  
E. Brown's Portable Blast Gauge for the plug hole, Steam Gauges, Blast Gauges, Mercury Gauges, Recording Steam Gauges, Engine Counters, Indicators for ascertaining the Horse Power.

## REVOLUTION INDICATORS.

which constantly indicate without the use of a watch, the number of turns per minute made by a Steam Engine.



**THE CHICAGO SCREW CO.**  
FINE MACHINE, CAP AND SET  
**SCREWS**  
22-24 SOUTH JEFFERSON ST. CHICAGO.  
ESTABLISHED 1872.  
Send for price list.

**Steam Oil Stone Works.**  
**F. E. DISHMAN,**  
Successor to Wm. Galbreath & Co.  
Manufacturer of and Dealer in the Best Washita, Arkansas, Hindostan and Sand STONES,  
Of various sizes and patterns, suited to every variety of Mechanical use. New Albany, Ind.  
Send for price list.



# L. COES' SCREW WRENCHES.

Genuine Improved Patent

Manufactured by

L. COES & CO.,  
Worcester, Mass.



We invite the particular attention of the trade to our New Straight Bar Wrench, *widened*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to any strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

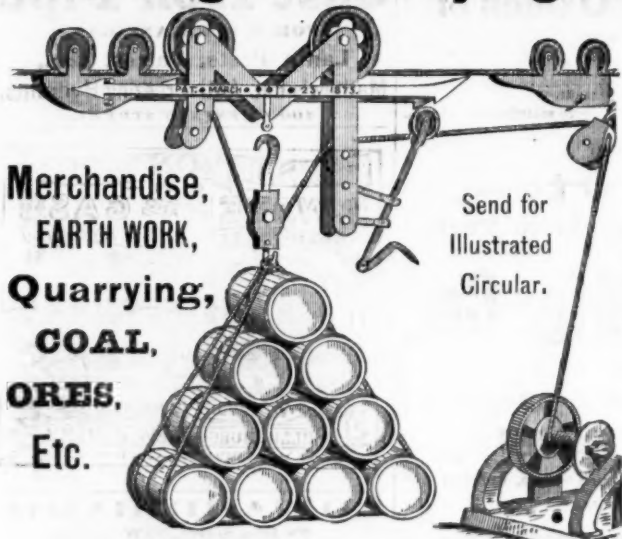
We would also call attention to the fact, that in 1869 we made several important improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were at once closely imitated and sold as the *Genuine Wrench* by certain parties who seem to rely upon our improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be good evidence that we manufacture a superior Wrench, we wish the trade may not be deceived on the question of originality. Trusting the trade will fully appreciate our recent efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

"L. COES & CO."

Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.  
HORACE DURRIE & CO., Sole Agents.



## Hoisting and Conveying Machine



These machines are Automatic, combine simplicity, general utility, and great facility in their working. Weighing apparatus can be attached to the machine and will weigh without cost.

Engineers' Office, New York.  
MANHATTAN Gas Light Co., New York.  
We use five machines most of the time, storing 200 tons in 10 hours with each machine and one man, at a cost of three cents per ton. When using three machines the cost is 15 cents per gross ton.

BLACK DIAMOND STEEL WORKS, Pittsburgh, Pa.  
The Hoisting and Conveying Machine suits us; we cannot say too much in its favor.

LEHIGH & WILKES BARRE COAL CO., 20th St., E. R., New York.  
We use your machine, one man only being required to operate it. It is a decided improvement over any method we have ever seen for hoisting and conveying material of any kind.

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## The Old Reliable Pioneer Poke.

The only Poke made with an oil tempered Cast Steel Spring. Our Pokes are manufactured under the personal supervision of the proprietors themselves, from the very best selected Oak and Hickory Timber, and finished in the very finest style. We warrant our goods to be first-class in every respect. For further particulars and price please address

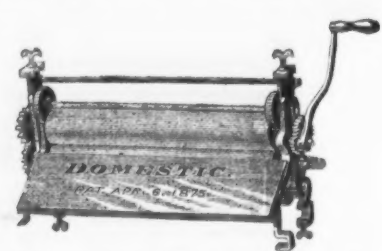
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## THE "Light Running" DOMESTIC WRINGER. THE "Light Running" DOMESTIC MANGLE.



With Purchase Gear.

Latest Improved and Best. Will do the most work with the least labor. Turns Easier, has greater capacity, will wring drier, is simple, strong and durable.



With Anti-Friction Rolls,

FOR IRONING CLOTHES WITHOUT HEAT,

giving a GLOSS and BRILLIANCY of luster to linens impossible to be obtained from heated irons and in

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The power required to work this Mangle is DIMINISHED MORE THAN ONE-HALF, and a child 12 years of age can work it easily.

It is a well established fact that clothes mangled are more healthy and last longer than when done by the hot iron.

## BAILEY WRINGING MACHINE COMPANY,

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This set of GARDEN TOOLS, is put up in a nice paper box, and is superior to any other in the market. The tools are made of the best quality of Steel, highly polished, and of malleable iron polished or painted, with birch handles. We will make it an object for every dealer to handle them.

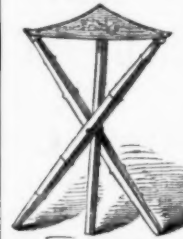
PRICE \$15, PER DOZEN SETS.

This MOSQUITO BAR is large enough to cover a full size bed. It has a nice Folding Frame, best quality of netting, with cord and ring complete for hanging. It is as good as those which are usually sold for \$5.00.



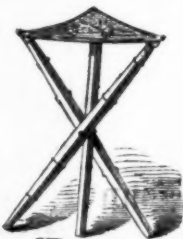
PRICE, \$24 PER DOZEN.

## CENTENNIAL CHAIR.



This Chair is made of the best second growth White Ash, finished on the wood, with Brussels Carpet Seat. It shuts up to the size of a single chair post, and weighs only one pound. Every person who forgets to take one with him when he goes to the Centennial, will be sorry when he gets there, as no chairs are provided for visitors, and they get very tired. Every store in the land can sell a few of them at a profit. They are a very popular article here.

PRICE, \$12 PER DOZEN.

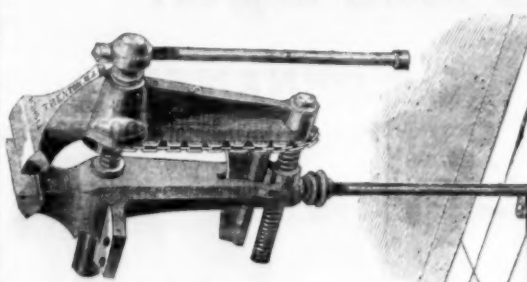


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We are now ready to furnish, as the result of more than thirty years' experience, our latest style of Vise—the best yet made. It is stronger than any other, whether of Foreign or of American make; always parallel and holding with a tighter "grip." The jaws are of convenient shape for the workman to get near his work equally well for filing or chipping. Instead of the heavy, clumsily formed jaws of the cast iron Single Screw Vises of the common "parallel" type, and which, depending upon slide alone for preserving parallelism, can never be screwed up very hard without "jamming" on the slides or breaking.

Our New Vise combines all the advantages of the "Peter Wright" Leg Vise, of strength and lightness, fastening to the floor and bench, and at the same time greatly superior to it: it is always perfectly parallel at all points of opening, and never gets out of line. Embodying the same general principle as the well known Chain Vise, so long made by us, we have by new, scientific proportioning of all the parts, and with our recently improved metals for their manufacture, obtained so perfect a tool, that we now warrant these Vises for three years from date of manufacture stamped upon each.

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Prices with Special Discounts to the Trade.

No.	Jaws	in. x in.	Screws	in. diameter.	Lever	in. long.	Opens	4 1/2 in.
1	2	4 1/2 x 1 1/2	1 1/2	1 1/2	13	13	5 1/2	12 00
2	3	6 x 1 1/2	1 1/2	1 1/2	16	16	8 1/2	17 00
3	4	8 x 1 1/2	1 1/2	1 1/2	19	19	11 1/2	22 00
4	5	10 x 1 1/2	1 1/2	1 1/2	24	24	14 1/2	30 00
5	6	12 x 1 1/2	1 1/2	1 1/2	28	28	17 1/2	34 00

All sizes of these Vises furnished with Swivel Attachment, at an additional cost of \$1 to \$3. Sold at the General Agencies.

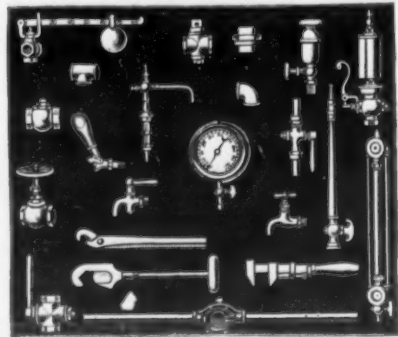
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After the severest tests for the past four years, these skates are now admitted to be the only practical **SELF-ADJUSTING SKATES IN MARKET**. The clamps are first adjusted to the shoe by turning the thumb-screw D when the lever C is in the above position; when once adjusted, place the skate on the foot, close the lever C, and the skate is securely fastened to the foot. By the action of the clamps, the skate is always in the center of the foot, and cannot slide from side to side as in other clamp skates. They require no heel plates, key or wrench.

**PRICE LIST.**  
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It Has More Good Points, Less Complication, More Adaptability,  
Larger Capacity, Does More and Better Work, Takes  
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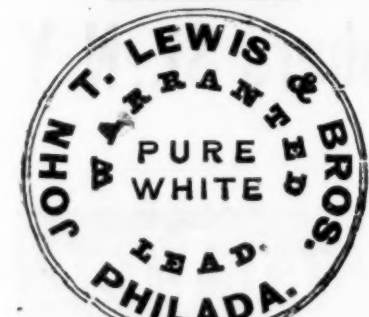
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**DON'T YOU FORGET IT.**

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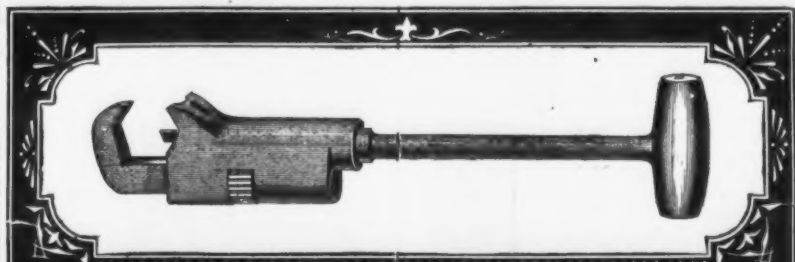
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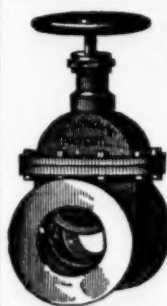
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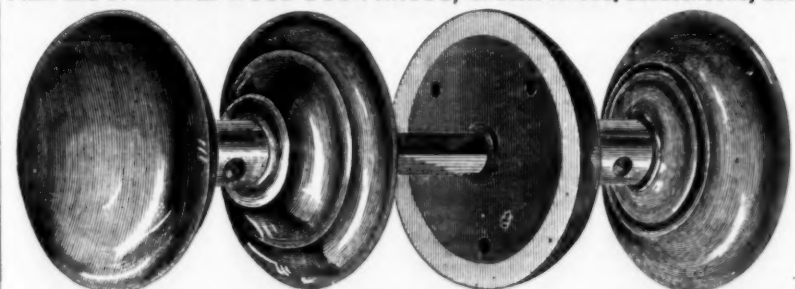
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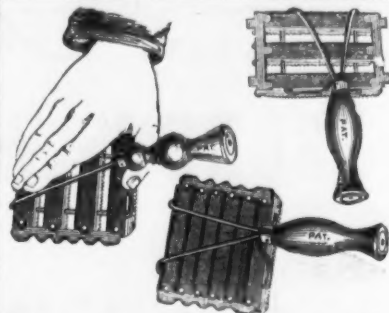
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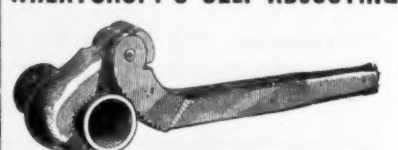
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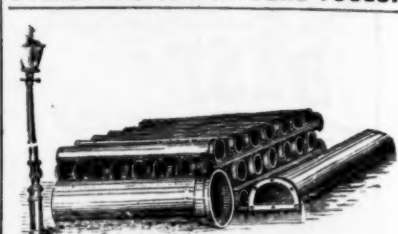
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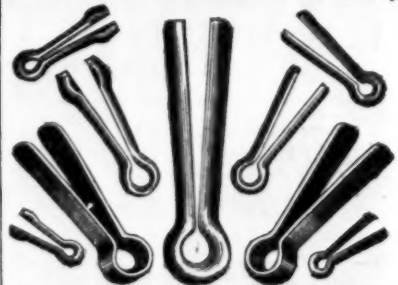
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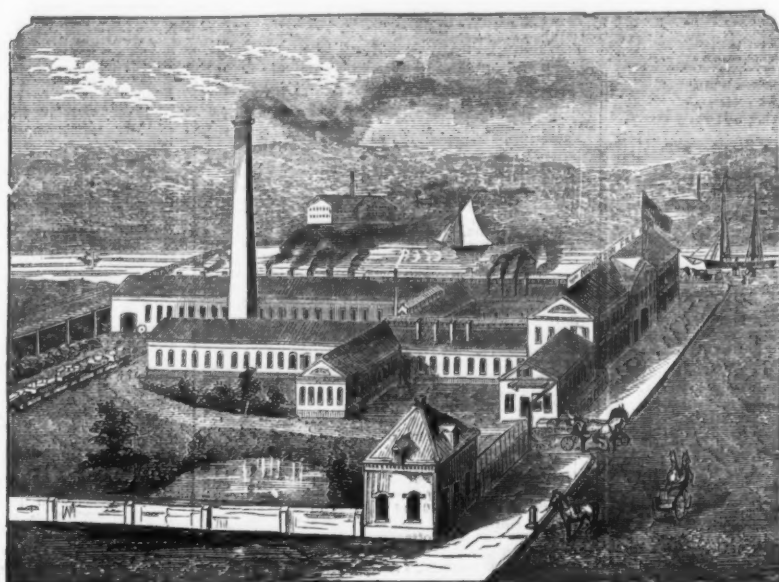
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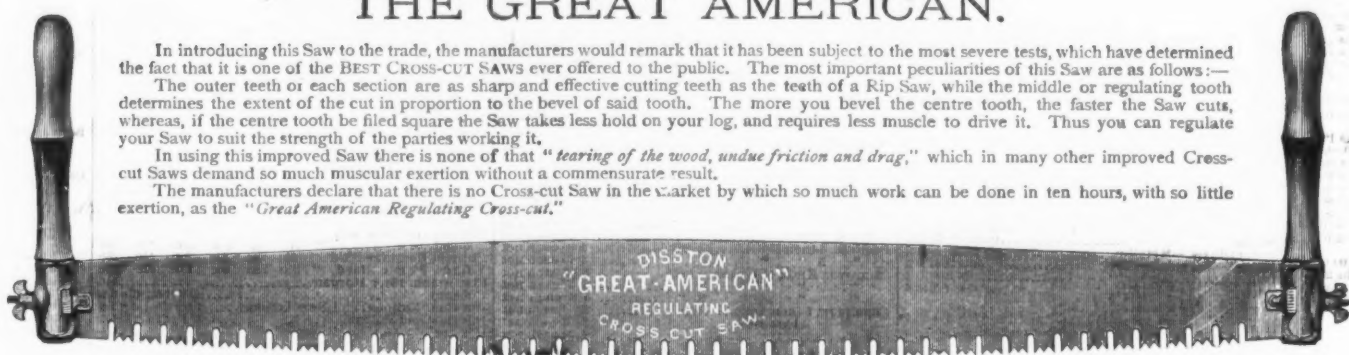
# Keystone Saw, Tool, Steel and File Works.

Front and Laurel Streets, Philadelphia.

## HENRY DISSTON & SONS, Hand, Panel and Rip Saws and Handled Saws OF EVERY DESCRIPTION.

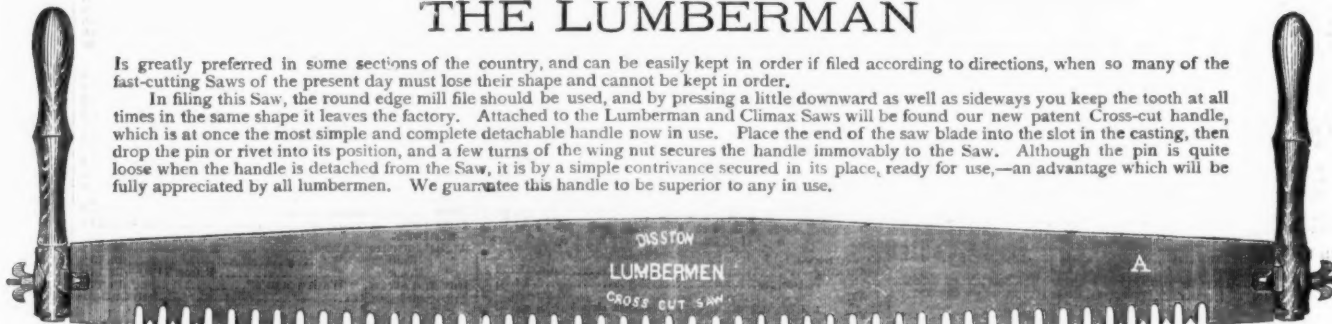
### THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—  
The outer teeth or each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.  
In using this improved Saw there is none of that "tearing of the wood, undue friction and drag," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.  
The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "Great American Regulating Cross-cut."



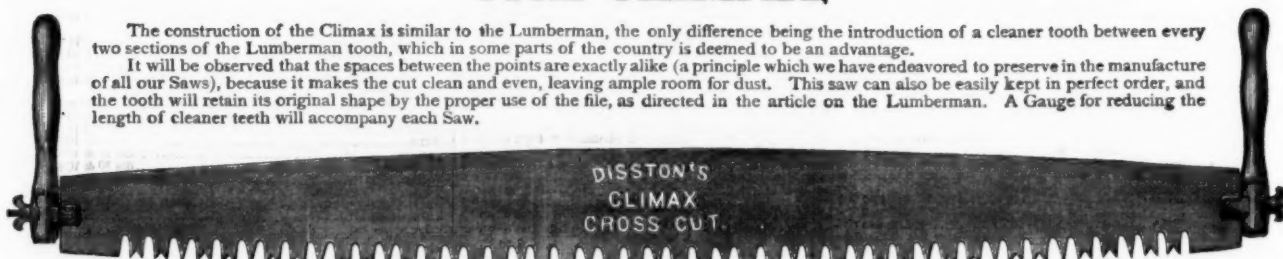
### THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.  
In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.



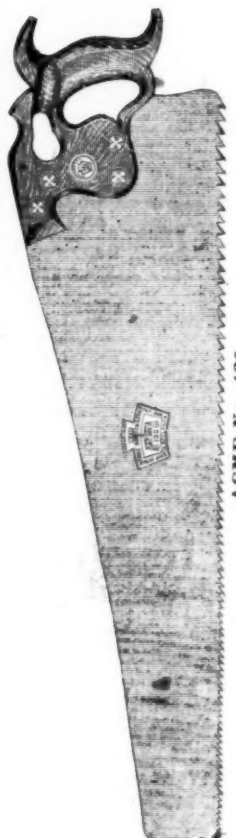
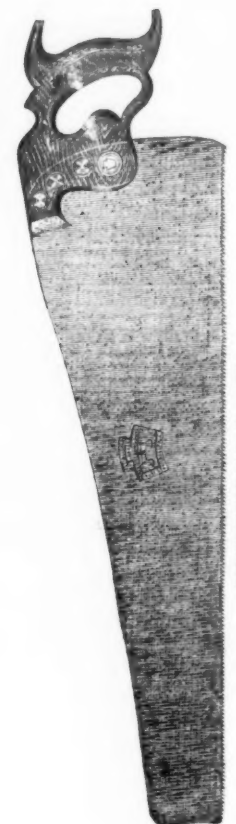
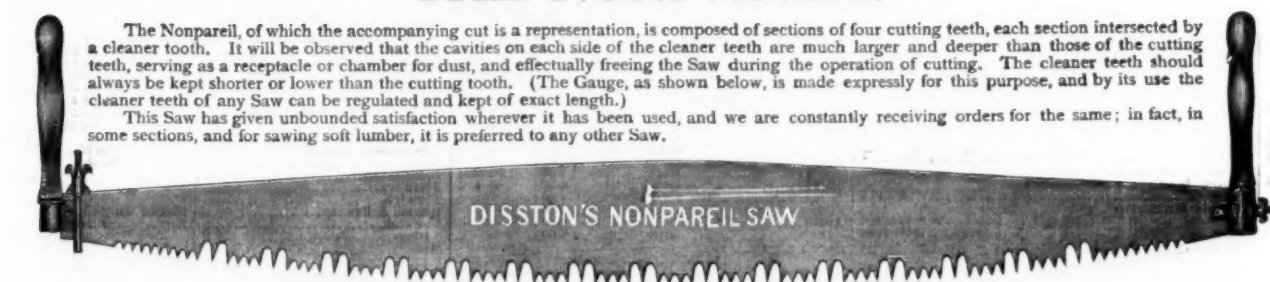
### THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.  
It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.



### THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)  
This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.





## New York Wholesale Prices, September 27, 1876.

## HARDWARE.

[illegible]



1/2 in, Copal, .....	38
" Damar, .....	38c
" Shellac, English, .....	50c
" .....	50c
Attarge, .....	9 1/2
Pumice Stone, selected Lumpa, .....	4 @ 6c
" powdered, .....	4 @ 6c
Putty in bladders, .....	3 1/2
" in bulk, .....	3c
Rotten Stone, soft, English, .....	3c
Sprits Turpentine, .....	33c
Whiting, Spanish, .....	3c

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FRENCH WINDOW GLASS.  
Prices current per box of 30 feet.

Single Thick.					
SIZES.	1st.	2d.	3d.	4th.	
6 x 8 to 10 x 15.....	\$ 7 50	\$ 6 75	\$ 6 25	\$ 5 75	
11 x 14 to 16 x 24.....	8 50	7 75	7 25	6 00	
18 x 22 to 30 x 30.....	10 75	9 75	9 25	7 75	
15 x 36 to 24 x 50.....	12 25	10 75	9 00		
18 x 36 to 34 x 50.....	13 00	11 50	9 75		
26 x 36 to 26 x 44.....	14 50	13 25	10 75		
26 x 46 to 30 x 50.....	15 00	14 00	11 25		
30 x 51 to 30 x 54.....	16 00	14 50	12 00		
30 x 56 to 34 x 6.....	17 25	15 50	13 00		
34 x 36 to 34 x 60.....	18 25	17 25	15 00		
36 x 30 to 40 x 60.....	20 75	18 75	17 25		

Double Thick.				
SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.....	\$12 00	\$11 00	\$10 00	\$ 9 25
11 x 14 to 16 x 24.....	13 75	12 50	11 75	10 50
18 x 22 to 30 x 30.....	17 25	15 75	14 00	
15 x 36 to 24 x 50.....	19 75	17 25	14 50	
18 x 36 to 34 x 50.....	21 00	18 50	15 75	
26 x 36 to 26 x 44.....	23 25	21 25	17 25	
26 x 46 to 30 x 50.....	24 00	22 50	18 00	
30 x 51 to 30 x 54.....	25 75	23 50	19 25	
30 x 56 to 34 x 56.....	27 75	25 00	21 75	
34 x 36 to 34 x 60.....	29 25	27 75	24 00	
36 x 30 to 40 x 60.....	32 25	30 00	27 25	

Sizes above 40 x 60—10 00 per box extra for every 4 1/2 inches.  
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.  
Discount 50c 15c.

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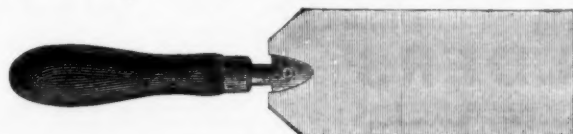
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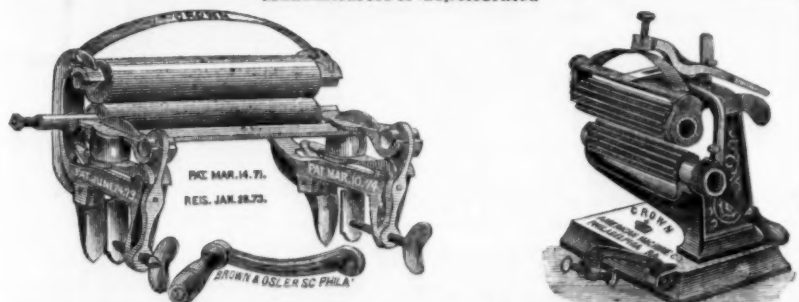
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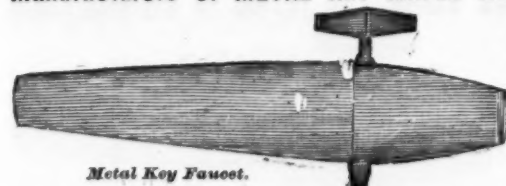
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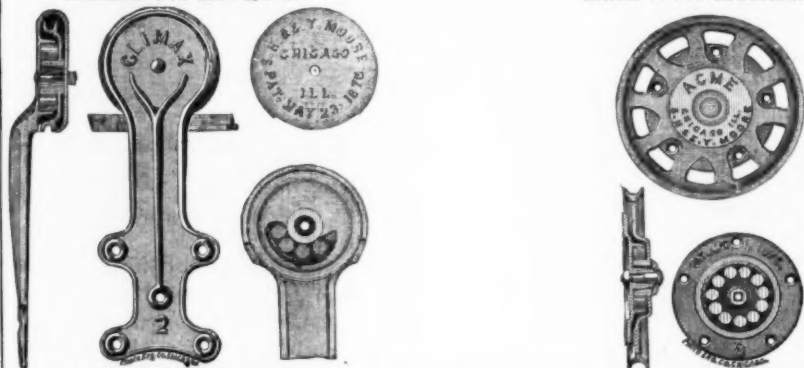
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"CLIMAX"

Barn Door Hangers.

"ACME"

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The "CLIMAX" Hanger is simple and substantial in its construction. A circular cup on the head contains a set of nine chilled iron rollers, within which the hub of the wheel revolves. The rollers do away with the friction and wear on a center pin which is the objection to the common wheel hangers. In the "CLIMAX" there is the friction of rolling surfaces only. Other hangers have the wheel alone, or the rollers alone; the combination of both in the Climax makes it the easiest running hanger in existence.

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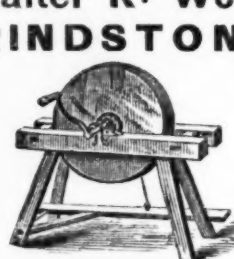
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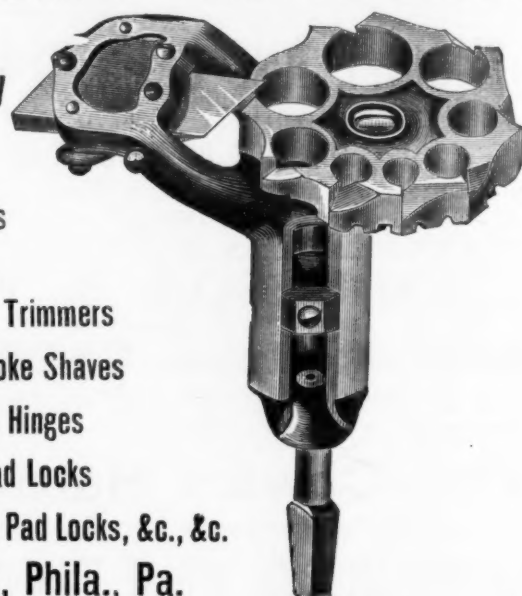
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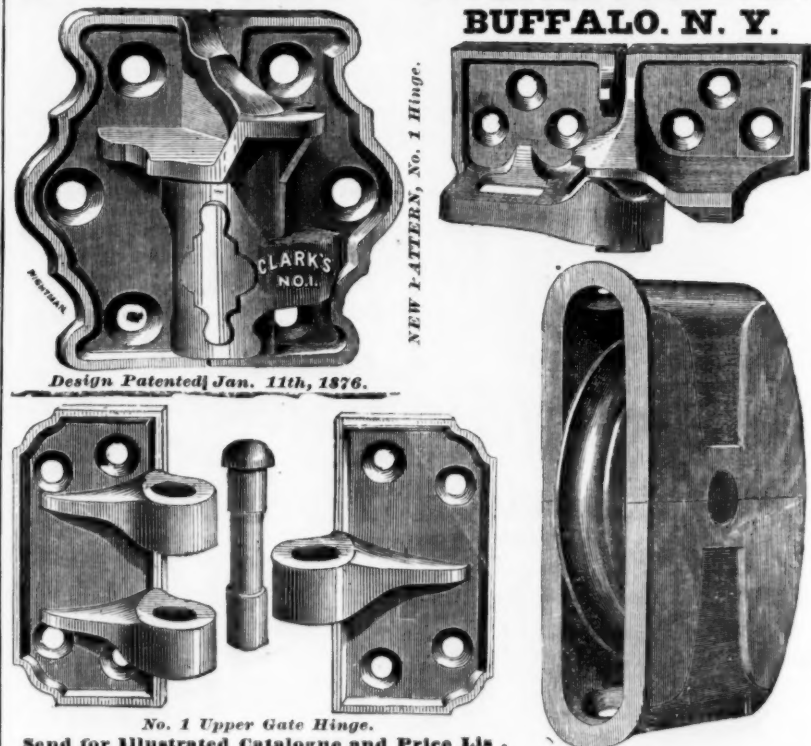


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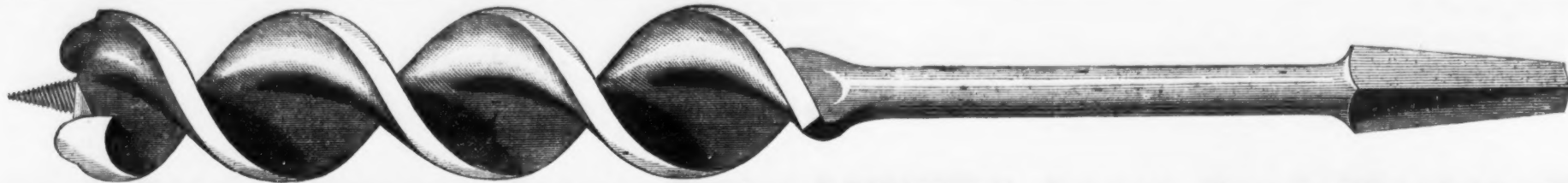
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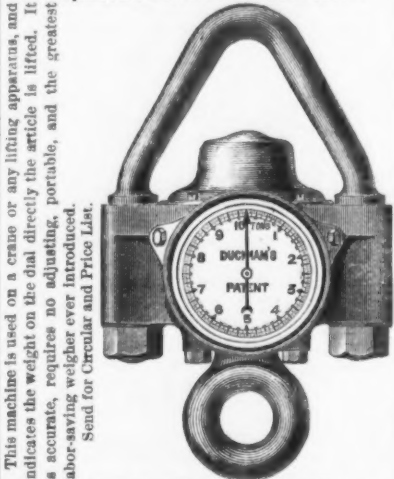
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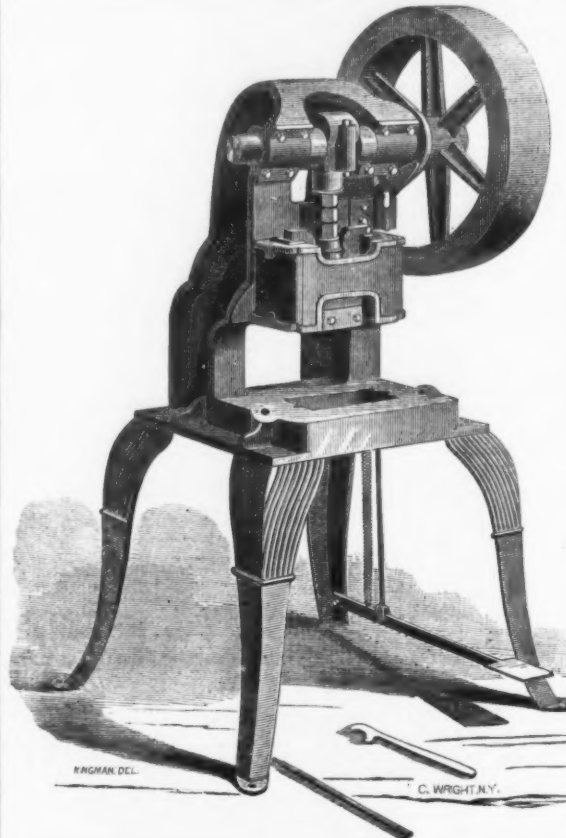
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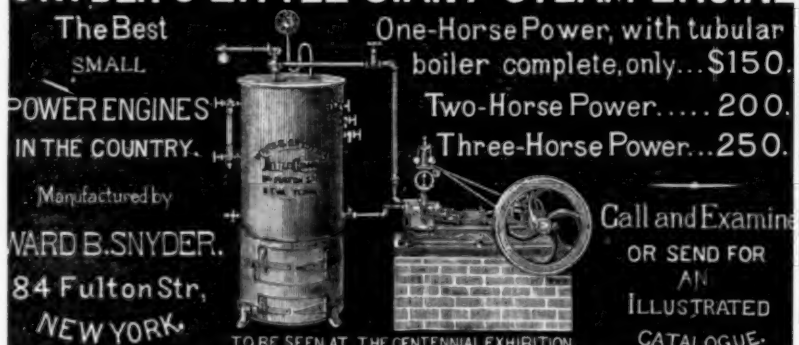
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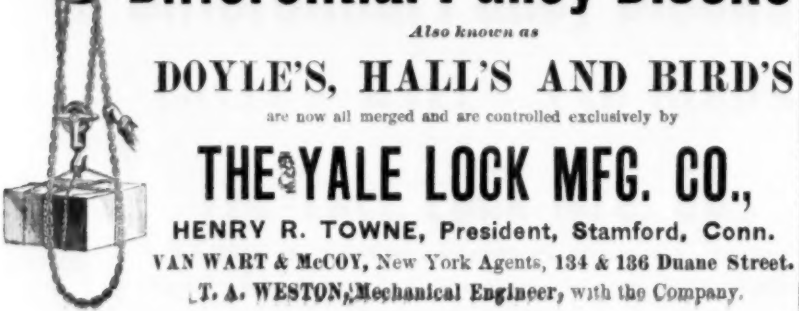
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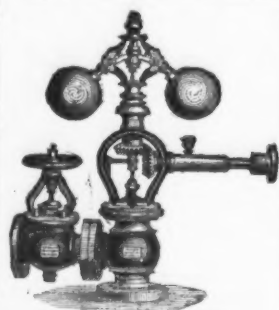
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It is a common method to advertise Governors without cost, unless satisfactory to the customer, and then charge High Prices for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

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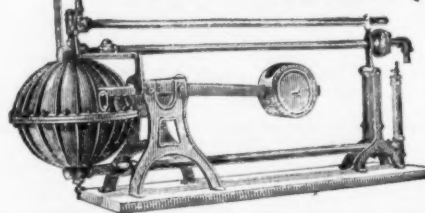
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No Charge for Boxing & Cartage.

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Size, Inch.	Plain.	Bright Finish.	Extra for Lever.	Stop Valve.
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3	25.00	27.00	3.00	10.00
3 1/2	27.00	29.00	3.50	10.00
4	29.00	31.00	4.00	10.00
4 1/2	31.00	33.00	4.50	10.00
5	33.00	35.00	5.00	10.00
5 1/2	35.00	37.00	5.50	10.00
6	37.00	39.00	6.00	10.00
6 1/2	39.00	41.00	6.50	10.00
7	41.00	43.00	7.00	10.00
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8	45.00	47.00	8.00	10.00
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## The Albany Steam Trap.



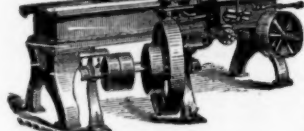
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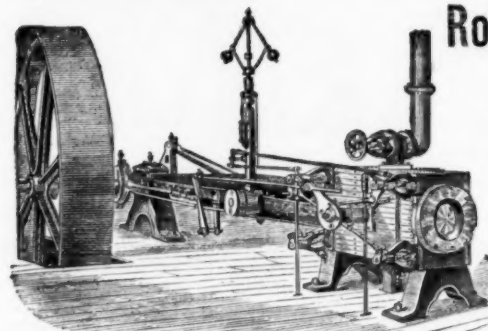
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Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.



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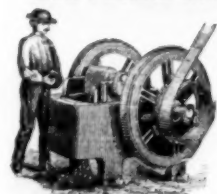
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MULTIPLE DRILLS. 2 to 20 Spindles.  
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New Pattern with Important Improvements & Abundant Strength



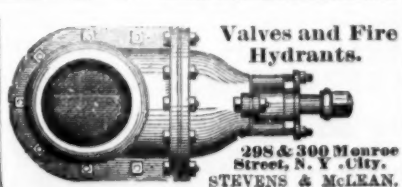
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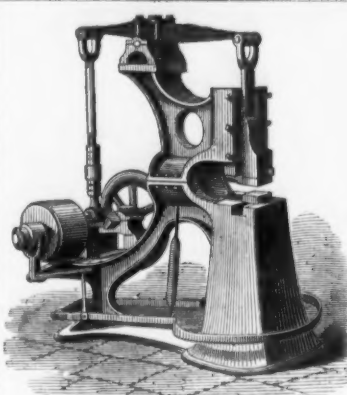


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New York,  
AGENTS.

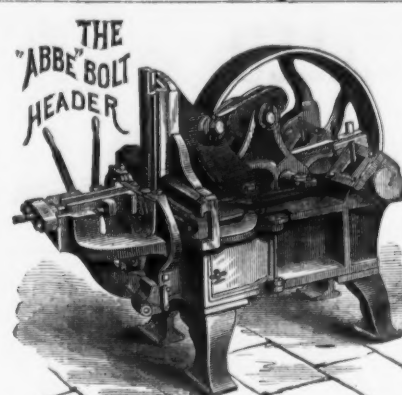


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THE  
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Of these Machines we are building sizes to meet the requirements of all Manufacturers and Workers of Iron and Steel. In simplicity, durability, ease of operation, accuracy, and range of work, we guarantee them superior to any Machines of their kind produced in the world. For prices, references, and full descriptive circulars, address

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Manchester, N. H.

## Knowles Patent Steam Pumps

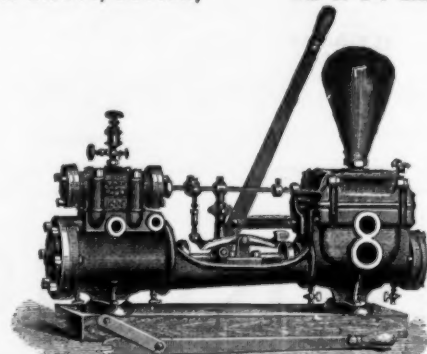
MANUFACTURED BY THE

**KNOWLES STEAM PUMP WORKS,**  
WARREN, MASS.

WAREHOUSES:

14 & 16 Federal Street, Boston,

92 & 94 Liberty Street, N. Y.

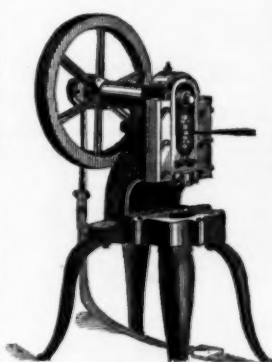


Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

## FIRE PUMPS a specialty.

Mining Pumps (both Double Acting Plunger, and Piston Pattern,) which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the Best.

Every machine furnished under a complete guarantee.



## A. H. MERRIMAN, Patent Power

**Punching Presses.**

Patentee and Sole Manufacturer.

I warrant every part of this Machine to stand the shock of the wheel running at 125 revolutions.

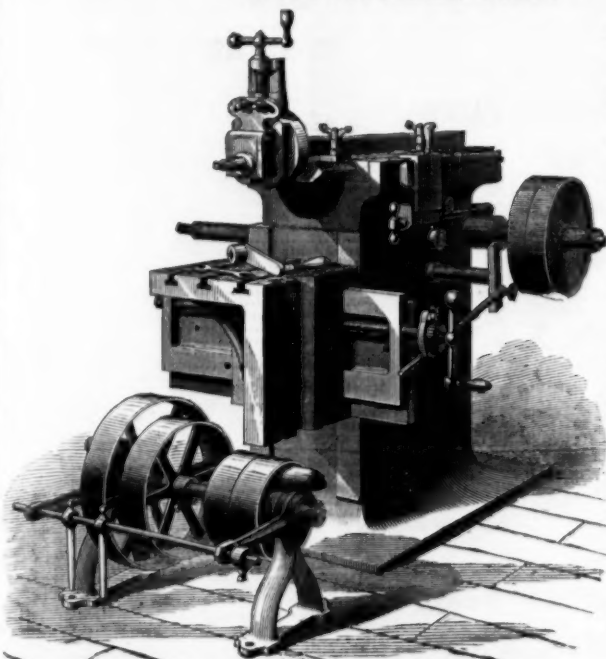
West Meriden, Conn.

Machinery Hall, Philadelphia, Section B 4, Columns 28 and 29.

## THE HENDEY MACHINE CO.

MANUFACTURERS OF

**THE MANVILLE  
Patent Planers and Shaping Machines.**  
WOLCOTTVILLE, CONN.

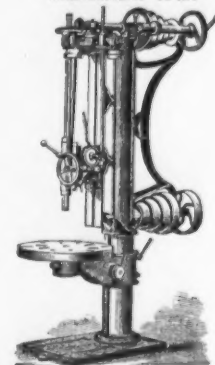


Any length of stroke from 3/4 to 24 inch in length, while machine is running with perfect uniformity of speed of cutting tool. Automatic cross feed of 19 inch and 16 inch, from top of table to bottom of slide when table is down. Send for Circular and Price List.

T. S. & A. J. KIRKWOOD, 271 & 273 Lake St., Chicago, Agents.

## P. BLAISDELL & CO., WORCESTER, MASS.,

Manufacturer of the



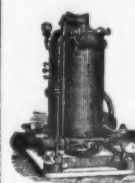
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And other First-Class Machinists' Tools.

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DEALERS IN ALL KINDS OF

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West Virginia Lubricating Native Rock Oil! Used by most of the Railroads in the United States, Canada and Europe, and by Mechanics on all kinds of Machinery. The Safest, Cheapest and Most Reliable Lubricator in the world. Obtained the Highest Prize at the Paris Exposition, 1875, 20 and 21 Gravity. No. 26 CEDAR STREET, NEW YORK.



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SAFEST, CHEAPEST & BEST.

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Steam Pumps.

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Stubs' Tools, Files, Bright Round Steel Wire, Bar & Sheet Steel, &c.



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For Scroll Sawing.

French, German, English & American

TOOLS, FILES, STEEL WIRE AND

SUPPLIES.

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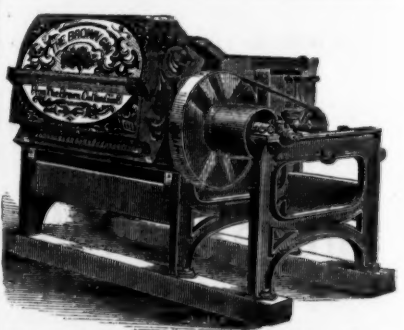
**ALMOND DRILL CHUCK.**

## OHL & HAUSCHILD, Engineers & Machinists

And manufacturers of

Lathes, Shapers, Slotters, Planers, Gear Cutters, Drill and Power Presses, Pulleys, Hangers and Shaftings, Machinery and Machinists' Tools in general.

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Kearney (East Newark), N. J.



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NEW LONDON, CONN.

Manufacturers of

**COTTON GINS,**

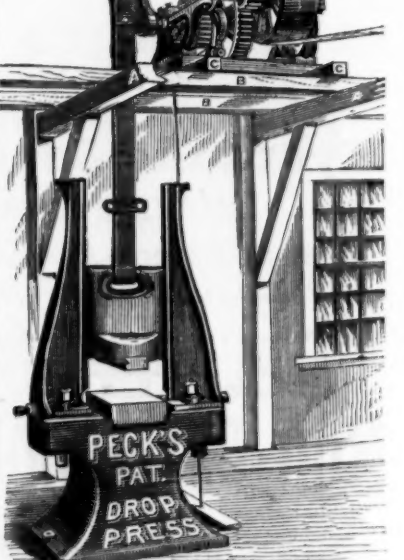
With or without

Self-Feeding Attachment & Condenser.

Cotton Gin Saws, Ribs and other Gin materials. Also

Albion's Saws, and Screw Cotton, and Hay

Press. Send for Circular.



I have the largest and best stock of Drop Press Patterns in the country—suitable for Forging, and all kinds of Sheet Metal work.

## WHY THE BEST:

It requires less power, works faster, gives a harder blow with same weight of hammer, the rebound of the hammer is caught without lessening the force of the blow, the blow is uniform and not affected by variations in the speed of the driver. It is always in order. The Drop Press a specialty.

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Machinery, &c.

THE  
Shapley Engine

Patented Feb. 10, 1874.

COMPACT,  
PRACTICAL,  
DURABLE,  
ECONOMICAL.

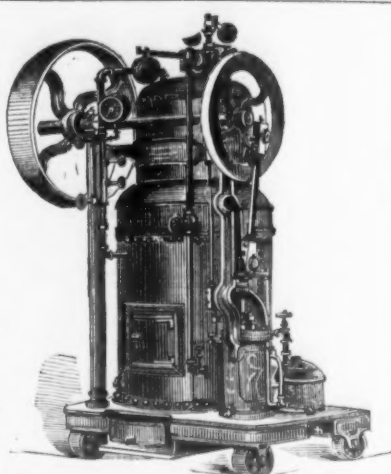
\$200.00.

Cheaper than any Engine offered of  
the same capacity.

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SHAPLEY & WELLS,  
Binghamton Iron Works,  
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Manufacturers of Steam Engines, Boilers, Water Wheels, Circular Saw Mills and  
Mill Work generally.



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JAMES MOORE,

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Engineer, Machinist, Founder and Boilermaker

CASTINGS of every description.

ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or  
Composition Metals.

Sugar Mill, Saw Mill and Crist Mill Machinery,

AND MILLWRIGHTING IN GENERAL.

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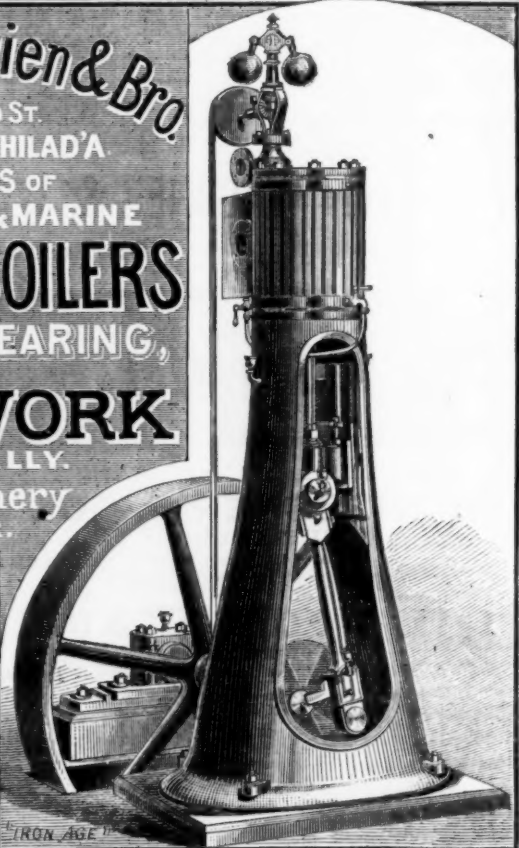
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BUILT TO ORDER.

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Heavy Designs, from  
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Visitors invited to in-  
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Keystone Pressure Blowers.

Anti-friction and noiseless; maximum blast and minimum power;  
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ALSO

KEYSTONE EXHAUST BLOWERS.

Made on same principle.

For Ventilating Mines, Buildings, etc.; Removing Dust,  
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Blower Guaranteed. Send for circular, or  
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KEYSTONE PORTABLE FORGE CO.,  
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Also, sole manufacturers of the celebrated KEYSTONE PORTA-  
BLE FORGES, for all classes of work, from the lightest to the heaviest.

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For Sale by all the principal Hardware Dealers.

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Of superior Quality and Hardware Specialties in  
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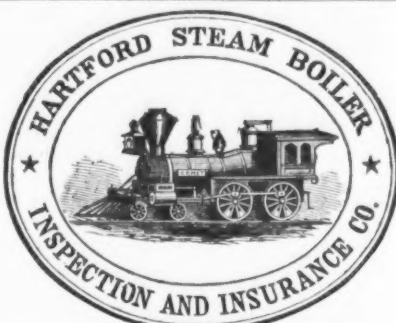
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Our Steam Hammers, Lathes, Planers, Drills and Bolt Cutters  
Are of Improved and Patented Construction.

Railway Turning and Transfer Tables,  
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GIFFARD'S INJECTOR--IMPROVED, SELF-ADJUSTING.



Issues Policies of Insurance after a careful Inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

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ARISING FROM

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The Business of the Company includes all kinds of STEAM BOILERS

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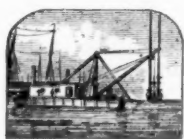
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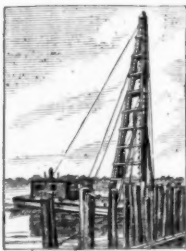
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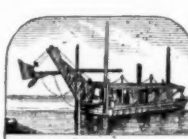
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SHAW'S PATENT "POWDER PILE DRIVER."



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BUILDERS OF STEAM DREDGING MACHINES,  
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IMPROVING RIVERS AND HARBORS,  
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NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,

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BIT STOCK DRILLS,

Drills for Coes, Worcester, Hunter and other Hand Drill  
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and Adjustable Drill Chucks, Solid and Shell Reamers.  
Drill Grinding Machines, Taper Reamers, Mill-  
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All Tools exact to Whitworth Standard Gauges.

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The Hartford Foundry & Machine Co.,

Successors to the WOODRUFF & BEACH IRON WORKS,

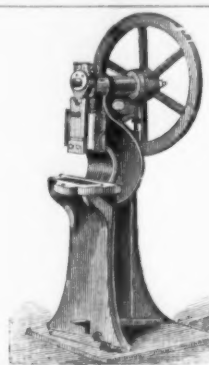
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Marine & Stationary Engines, Mill Gearing,  
Hoisting and Mining Machinery.

PUMPING ENGINES, for City and Town Supply a Specialty.

60 to 96 Commerce Street, HARTFORD, CONN.

Machinery, &c.



REPORT OF JUDGES

In Department V, Group 3, at the 44th

Exhibition of the

AMERICAN INSTITUTE,

Held in the City of New York, Oct., 1875.

No. 318, Drawing, Prop &  
Punching Presses.

THE STILES & PARKER PRESS CO.,  
Of Middletown, Conn.

The machinery exhibited by these makers is of a  
character that calls for special commendation. In  
addition to their well known punching presses, to  
which a new feature has been added in a press ad-  
justable to an inclination for discharging work left  
above the die, there are exhibited by them a com-  
bined punch and shears, a drawing or blanking press,  
and a drop.

In all these there is shown the highest me-  
chanical culture, applied to meet every practical requirement,  
to avoid every practical difficulty, and to enlarge the  
range of application of the machines, by devices  
which are at once simple, elegant, and effective.  
Your committee would unhesitatingly recommend  
for this exhibition the "Medal of Progress," but  
find such award debared by the rule of the Institute,  
forbidding such award unless a Silver Medal has  
been previously awarded. We, therefore, respect-  
fully recommend the award of a Silver Medal.

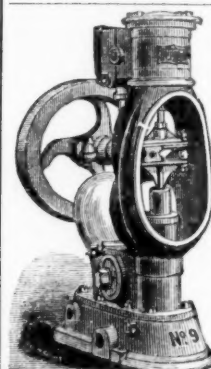
Silver Medal Awarded.  
A true copy from the Report on file.  
JOHN W. CHAMBERS, Sec'y.

AQUOMETER  
Steam Pump.

Highest Premium awarded by  
Franklin Institute, 1874,  
For Simplicity, Economy of  
Construction & Efficiency.

An absolutely Durable, Cheap, Efficient and Eco-  
nomical Steam Pump. Requires no special care or  
lubricating. Warranted. Address for circular,

AQUOMETER STEAM PUMP CO.,  
10 South Dela. Avenue, Philadelphia,

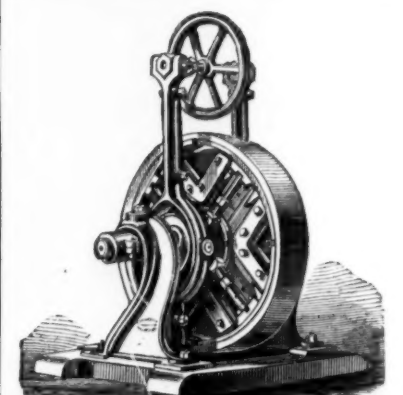


Send to us for Catalogue.  
Valley Machine Co.

EUREKA SAFETY POWER!

Practically impossible  
to explode. Tested to 30 lbs  
pressure per square inch. We  
sift 2 inch seasoned oak-grids  
bushels Corn per hour. Price  
\$250. Also, Stationary Engines  
and Boilers and Spark Arres-  
ing Portable Engines for  
plantation use. Send for our cir-  
cular. Discount to the trade.

B. W. PAYNE & SONS,  
Corning, N. Y.



VOLNEY W. MASON & CO.,

Manufacturers of PATENT

FRICTION PULLEYS,

Friction Clutches

For Connecting Shafting and Gearing,

ELEVATORS.

Lafayette Street, PROVIDENCE, R. I.



# TUBAL SMELTING WORKS,

780 South Broad Street, PHILADELPHIA.

PAUL S. REEVES,

MANUFACTURER OF

## ANTI-FRICTION METALS.

XXX Genuine.....	40c	C.....	20c
SS.....	35c	D.....	15c
.....	30c	E.....	10c
.....	25c	F.....	10c

Note.—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

BRASS CASTINGS, 21 to 35c.      INGGOT BRASS, 19 to 25c.      BRASS TURNINGS AND OLD METALS WANTED.

ESTABLISHED 1842.

# WM. & HARVEY ROWLAND,

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P. O. Address: Frankford, Philad'a.      MANUFACTURERS OF ALL KINDS OF

## Elliptic, Platform AND C Springs,

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

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CAST SPRING AND PLOW STEEL.  
CAST SHOVEL, HOE AND MACHINERY STEEL.

OXFORD TOE, SLEIGH, TIRE AND SPRING STEEL.  
BESSEMER SHOVEL AND PLOW STEEL.  
BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.  
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

## Iron Clad Can Co.,

23 CLIFF STREET, N. Y.



THIS CUT REPRESENTS THE  
**IRON CLAD  
FIRE SHOVEL**

We call the attention of the trade to our New Stove or Fire Shovel. It is far superior to anything in the market, for the following reasons:

It is made from one piece of Metal, both blade and handle; therefore is as cheap as the cheapest. There being no corrugations to catch dirt, it is always clean. The handle being half round at the junction of the blade makes it the strongest Shovel ever manufactured, (where all other shovels fail.)

The upper part of the handle being round makes it the most convenient to handle, and the same being hollow is always cool. To convince yourselves of the above facts, send for sample.

P. S.—We have noticed a circular issued by the East River Sheet Metal Mfg. Co., informing the Trade that there are parties manufacturing a Fire Shovel made in one piece and corrugated at or near the junction of handle and blade, upon which they hold a patent. We do not know to whom they refer, but if to us we wish to say that we manufacture our Shovel under Letters Patent of the U. S. granted to us and we guarantee all parties purchasing goods from us against all loss or damage by infringement of every kind and nature.

IRON CLAD CAN CO.,

Manufacturers of STAMPED WARE, CAN TRIMMINGS, COAL HODS, Etc.  
Send for Price List.

## Edgar's Patent "Gem" & "U. S." Stove Shovels.



PLAIN SOLID HANDLE,  
Patented Nov. 3, 1874.



IMPROVED OVAL HANDLE,  
Patented Jan. 5, 1875.



ENTIRELY ROUND HANDLE, Patented Feb. 22, 1876.

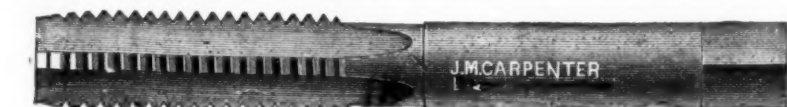
EAST RIVER S. M. MFG. CO., Sole Manufacturers, 206 Water St., N. Y.

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Manufacture the most reliable

## SILVER PLATED SPOONS & FORKS.

They are plated by weight, and not by time or guess, containing 30 per cent. more silver than the usual standard, on a base of Nickel Silver, and finished by hand. Each article is guaranteed by the trade mark and warranted to give full satisfaction. We ask of the trade a fair and impartial test, assuring them that the high standard already attained, shall be maintained. Send for Catalogue and Price.



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Journal Bearings. Castings for Cars, Mills and Machinery. Also supplied in ingots to the trade. Guaranteed to be the safest and most durable Journal Metal made. Office, near corner of 25th and R. R. Sts., Pittsburgh, Pa.

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## STEEL CASTINGS.

A Substitute for Steel and Wrought Forgings.

17 Circulars sent on application.

## Steel Castings

We make Steel Castings true to pattern, sound and strong. Can be worked same as bar steel. Plowshares, Mold-boards and Land-sides, Anthracite Coal-breaker Teeth, Wheels and Pinions, Dies and Hammer Heads, Engine and Machinery Castings of all descriptions, Railroad Frogs and Crossings.

Invaluable for all articles requiring great strength and durability.

Send for Circular.

PITTSBURGH STEEL CASTING CO.,  
PITTSBURGH, PA.

## Crucible Steel Castings

Light and Heavy STEEL CASTINGS of superior quality made on short notice, true to pattern, solid, strong and durable, can be readily forged and tempered.

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PHILLIPS, NIMICK &amp; CO.

The only Manufacturers of

"Sligo" Fire Box Iron, Boiler Plate,  
Sheet and Bar Iron,

"Tyrone" Brand of Bar, Tank & Sheet  
Iron, Girder and Ship Plates, Angle  
and Horse Shoe Iron, &c., &c.

Plates Rolled 100 inches wide.

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South Side, Pittsburgh, Pa.

Sligo Stay Bolt Iron, Warranted Unexcelled.

BOILER HEADS &amp; FLUE HOLES

FLANGED TO ORDER.

Quality our Specialty.



UNIFORM SPEED

WARRANTED THE MOST PERFECT GOVERNOR IN THE WORLD

However great or violent may be the change of load, it will remain uniform in speed.

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TOLER'S PATENT Improved French Casters

The simplest in construction and most reliable ever offered to the public. Can be put on in half the time, and more permanently than the ordinary kind. Send for Illustrated Catalogue.

JOHN TOLER, SONS &amp; CO., Newark, N. J.

Small Gray Iron and Brass Castings.

SCRANTON Brass Works,

J. M. EVERHART,

Manufacturer of Brass Work for Water, Gas and Steam.

Castings and Jobbing promptly attended.

SCRANTON, PA.

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TUBAL-CAIN METAL WORKS  
MANUFACTURERS OF  
**ANTI-FRICTION METALS.**  
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PHILADELPHIA.

## Russell, Burdsall & Ward,

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Manufacturers of

Carriage, Tire, Plow, Stove.

AND OTHER

## BOLTS.

Carriage Bolts made from Best Square Iron, a Specialty.



M. W. ROBINSON, Sole Agent, 79 Chambers St., New York.

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3/8 in., No. 1, 2, 3, 4, 5, 6, 7, 8, 10.	2 in., No. 8, 9, 10, 11, 15, 16, 17, 20, 22.
1/2 in., No. 2, 3, 4, 5, 6, 8, 9, 10.	2 1/2 in., No. 11, 12, 13, 16, 17, 18, 20, 22, 24.
3/4 in., No. 3, 4, 5, 15, 16.	3 in., No. 10, 12, 13, 14, 16, 17, 18, 20, 22, 24.
7/8 in., No. 5, 7, 10, 12, 13, 16.	3 1/2 in., No. 13, 14, 16, 17, 18, 22, 24.
1 in., No. 5, 15, 17, 20.	3 in., No. 9, 14, 24, 26.
1 1/4 in., No. 11, 12, 15, 16, 17, 18, 20.	3 1/2 in., No. 14, 15, 16, 17, 20, 22, 26, 28.
1 1/2 in., No. 7, 8, 13, 15, 16, 20.	

## VAN WAGONER & WILLIAMS,

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## C. RIESSNER & CO.,

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"SUMMER QUEEN"

## Oil Cook Stove.

FOUR SIZES.

Suitable for all purposes, for Cooking, Baking and Ironing.



NON-EXPLOSIVE.



We beg to announce to the trade that our NEW CENTENNIAL GAS STOVE is now ready, and feel no hesitation in claiming it to be the most Perfect and Economical Stove in the market.



## GALVANIZED WIRE STRAND CLOTHES LINES.

Clean, strong, cheap, weather-proof, and will last a lifetime. In compact coils, about three times the diameter of above cut, and one hundred feet in length; each end carefully soldered.

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## Tackle Blocks

Of all Description.

## SHIP BLOCKS,

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Patent Pressed PUMP LEATHERS.

Dealer in LIGNUMVITAE WOOD.

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Its superior advantage in power at partial gate is universally acknowledged. Certain chutes at intervals remain fully open, the others close, thereby no offsets are made to destroy the power by creating conflicting currents. Mill owners, Millwrights and those of long experience with Turbines, pronounce Alcott's the most practical, simple and effective wheel in the market. Manufactured and For Sale by

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